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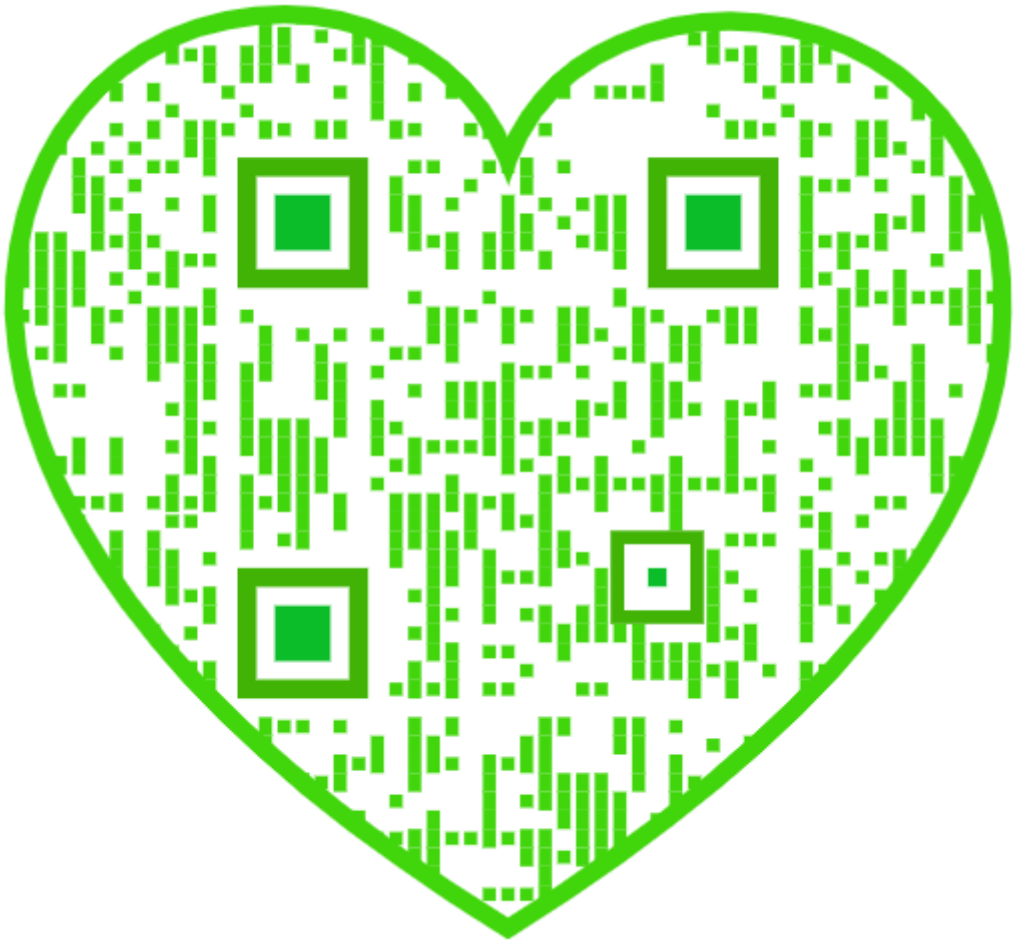

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ARCHITECTVRE

·THE· PROFESSIONAL · ARCHITECTVRAL · MONTHLY·

Vol. XLIV. CONTENTS No. 1

JULY, 1921.

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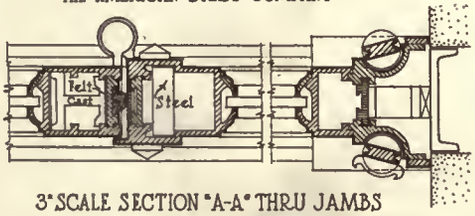

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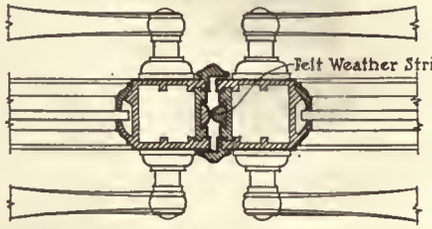

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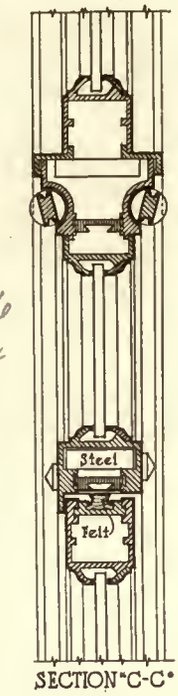

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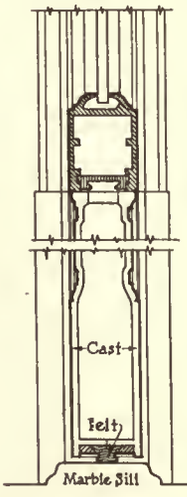

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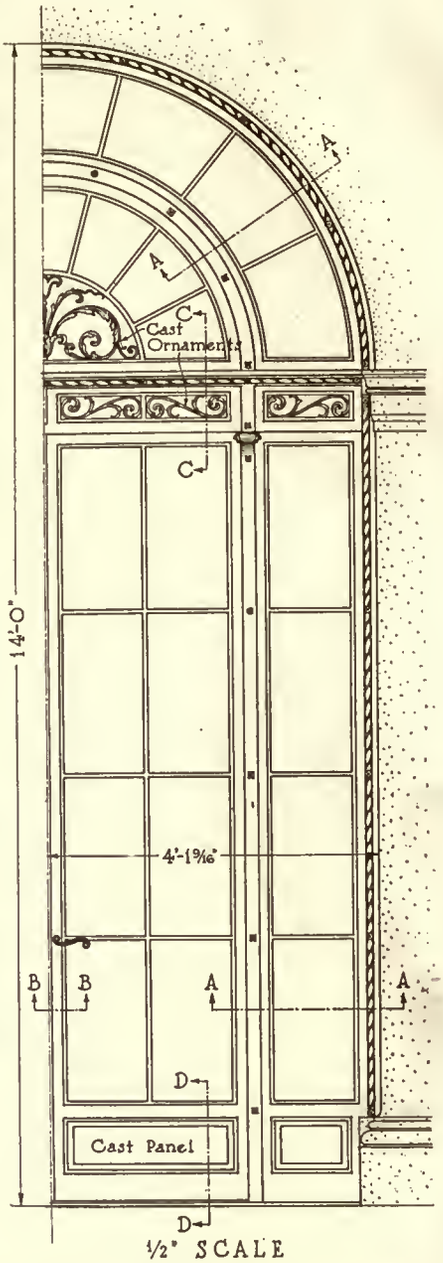

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MAIN ENTRANCE-DOORWAY, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Cass Gilbert, Architect.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLIV JVLY, 1921 NO. 1

The Detroit Public Library—A Municipal Temple of All Faiths

By Adam Strohm, Librarian

Bronze lamp-standard on balustrade.

THE new library building is a monument to intelligent citizenship and the desire of the community to make the avenues leading to the best fulfilment of individual endeavors and fruitful enjoyment of life as dignified and stimulating as the noble products of human mind can inspire. It is an event not only in the history of Detroit, but an entry also in the honorable records of a nation which is generously erecting and supporting free institutions. As white mile-posts they are dotted throughout the land, proclaiming the free spirit, the generous heart and good-will of America toward all those who with grateful and loyal hearts will guard what has been achieved and join their efforts for a common future.

The construction of this building consumed six years, but the moving forces that brought this structure into being reach beyond the decade of its erection. The power that carried the enterprise forward must be traced back to the headwaters from which has flowed the clear current that has invigorated the mind of the people from the days when American democracy first articulated its articles of faith—equal opportunity to understand and enjoy the fruits of civilization and the amenities of life. Toward that end our people have chosen to pool their resources and assume the burden of supporting jointly institutions that will ennoble the values of life and enable all to reach ever higher levels on their onward march.

The benefit and appreciation of such institutions as this are, of course, more far-reaching and permanent because of this gradually maturing popular will to have them than could be realized if they had come into being by the autocratic will of even a benevolent ruler or minority group.

Significant as the modern public library is as a product of democracy exercising its power and judgment in self-government, no less impressive is the government controlling this institution in endeavoring to give a service suitable to the needs of its constituency and free from the narrow principles of bureaucracy. A trained staff of workers is directed to establish helpful relations with all elements contributing to the intellectual and material energy and life of the community. Theirs is the duty to co-operate in the constructive work of social and municipal service, to serve as an information bureau to the agencies functioning for industrial and commercial prosperity, to aid the forces devoted to the artistic, moral, and intellectual aims of the thoughtful minds in the community, to supplement the schools in making the parents and children happy and competent guardians of the honor of the city to-day and to-morrow.

Mantel in children's room.

In so far as the governing body of the library administers its trust faithfully, its members may well be honored; in so far as the workers of the library fit themselves by liberal education and professional training to discharge their duties and deal with the public in a sympathetic, tactful, and competent man-

THE MOSAIC IN CEILING OF LOGGIA.

ENTRANCE-HALL AND MAIN STAIR.

MAIN ENTRANCE.

Cass Gilbert, Architect.

THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Ornamental plaster ceiling, Social Science and Civics Room.

ner, their reward should be worthy of the city and its great opportunity to encourage those things which are done all the more splendidly because they are done unselfishly.

Education and the arts will not propser if their nourishment is confined to local resources and the concerns of to-day. The resources of the library are gathered from the history and teachings of all humanity whereof records are available. Not only its great achievements, but its sacrifices, sufferings, and failures. It is this judgment of centuries as much as the voices of to-day that we offer to those who are willing to "weigh and consider" rather than gratify their own opinions. As we draw upon all ages and civilizations for gathering our material, so we also serve impartially all the varied people who come within our doors; people of many races, many minds, the climbers to the summit, those full of the zest of life, and the bruised ones, the man eager for quick returns, the scholar and the stranger. The library is their club; there is no intrusion on their inner life and mental adventures; they are given impersonal, tactful attention; librarians are pledged to good service, but not to patronage or servility.

Reflections of this kind prompted by the hour of dedicating the new building are but humble musings in the presence of the artistic loveliness and purity of the building which we have in a measure inherited from other ages.

The new building was designed by a great American architect, Cass Gilbert, and he has given us an artistic memorial of the rebirth of the classical ideas of beauty and truth. In accepting this building we should pledge ourselves to direct our efforts for the service to our people and our generation so as to keep faith with the immortal pre-Christian era of refinement and human craving for something truer than its struggling units.

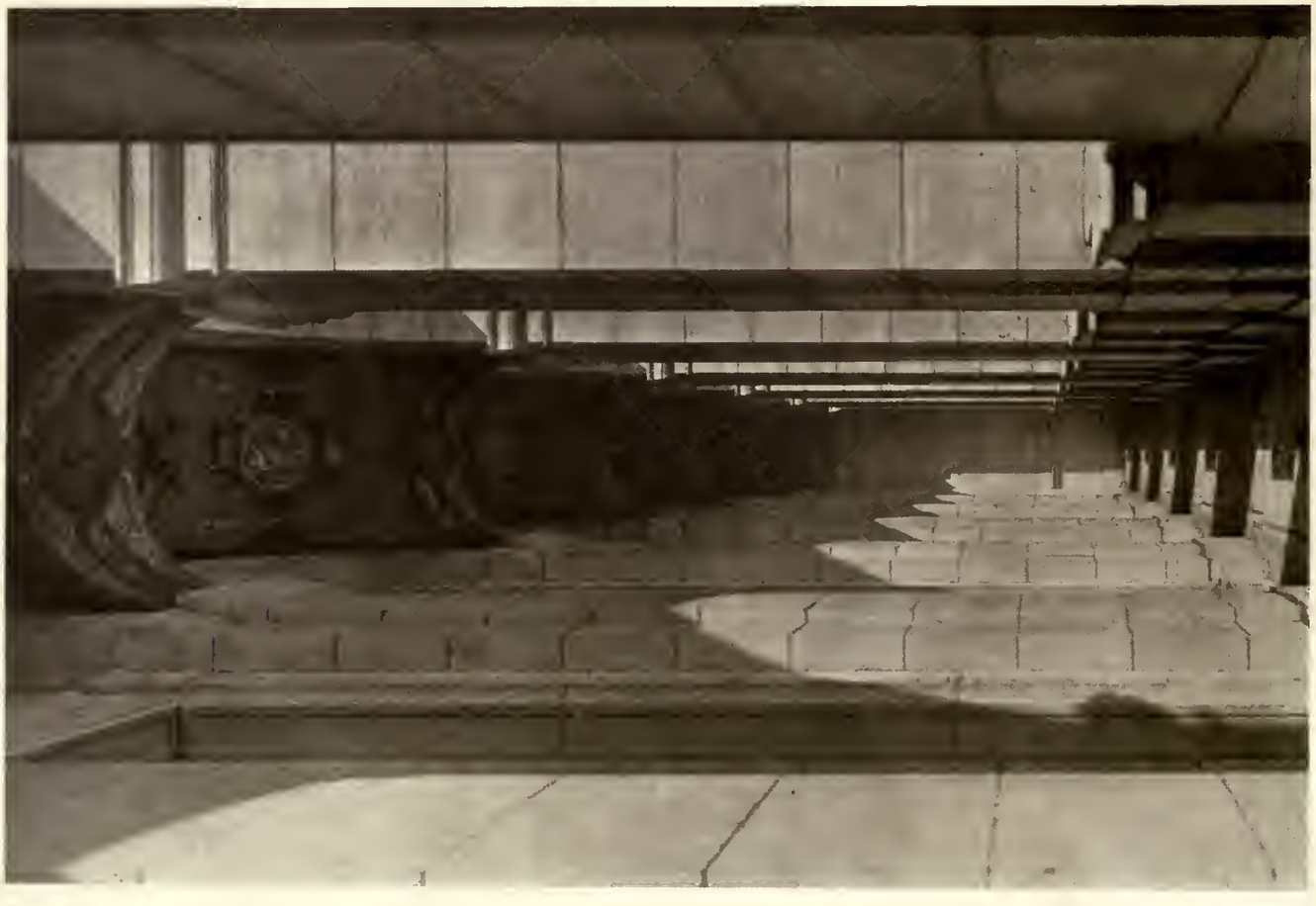
It will be our privilege to find inspiration in the Doric principle that entered into the nature of Greek art and ideals of life, namely, to refine with infinite patience a simple theme rather than to seek novelty in constant change. We also will concentrate ourselves on a few simple things, and our theme will be the "*development and application of a clear and fearless intellect in every domain of life.*"

Let us cultivate our senses to the full enjoyment of the most gracious activities of life and nature and partake of that intellectual tonic that is the reward of a disciplined mind and the balanced intellect which seeks to see conditions fearlessly and truly.

Ours is the task to promote the efficacy of reason and balance as against emotion and much modern sentimentality, shams, and unveracities.

A free people should be graced by the spirit of intellectual audacity and the power of human understanding. May the people that come within the sunlit beauty of this building feel the pure and serene atmosphere of the human mind at its best and realize that "life is more splendid than its husk."

CEILING, ENTRANCE-HALL. Cass Gilbert, Architect.



LOGGIA.

THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

DOORWAY, FIRST FLOOR.

BRONZE ELEVATOR ENCLOSURES.

BRONZE ENTRANCES TO DELIVERY-ROOM.

DOORS TO DELIVERY-ROOM. Cass Gilbert, Architect.

THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Carved marble frieze with bronze grilles, cornice, and terra-cotta coping

The Architecture of the Library

By Wm. B. Stratton, F. A. I. A.

THE new main building for the Detroit Public Library is getting the test of actual use, and our city is deciding that both in appearance and service the result is good. The building is taking its place naturally and quietly, and its place is that of our best building.

On the reader or borrower as he approaches the delivery desk from the street there is produced a most decided series of impressions. Entering through the single doorway he finds himself in a rather sombre corridor with direct light from the doorway only. Passing on between the columns he sees the light streaming across the raised landing, and as he proceeds up the stairway the light increases and the color brightens until he is in the great delivery-room, the heart of the building.

The librarian is enthusiastic in praise of his building, and both he and his staff declare the arrangements for book storage, handling, and issuing complete and perfect.

The building is the final result of one of the most perfectly planned and judged American competitions, the fairness of which in all respects was never questioned.

The competition programme indicated that it should be based on quite definite requirements as therein expressed. The competition was declared to be for the purpose of the selection of an architect and the requirements laid down worked perfectly in this respect. One curious result, however, resulted from the fact that the commissioners used the requirement in regard to size and cost as a basis for their appropriation. The cost for the purpose of the competition was based on the cubic contents from the main floor up and left the commissioners to provide for a complete basement floor later. An error like this would seem to be less liable to happen from the use of a newer form of programme which is springing up and which expresses the wishes of the owner in a freer, broader, and even poetic way, and throws more responsibility on the designer. The architect being directed to "express what is in his heart." It may be that with such freedom architects will be inspired to greater heights. He may even get a clearer view of what the Dutch architects have in mind when they name their organization "The Society for the Propagation of Architecture."

One critic sees the spirit of Florence expressed throughout the building and asks why this should be. We may all find some embarrassment in this question at first, and can only point to the various excursions into expression that we are told represent our place and time and even then we may be still somewhat in doubt.

Looking over the other plans submitted in this competition, we fail to find any expression of a distinctly local or even national character.

Through Cass Gilbert's master hand we have a wonderful building, so enriched with carving, color, painting, and mosaic as to possess a permanent educational force and one that gives a calm and distinguished background for our city's most treasured function.

THE new library, which is of modified Renaissance style, was designed by Cass Gilbert, whose plans were chosen from many submitted by leading architects of Europe and America. It is built chiefly of marble and has three floors, a basement and a mezzanine.

A notable feature of the decoration of the library is the liberal use of mosaic. Mr. Gilbert intrusted this work to Frederick J. Wiley, whose work on the Woolworth Building is so well known. The composition of the mosaic came from the studios of the Pewabic Pottery, conducted by Mary Chase Stratton and Horace James Caulkins. Mr. Wiley's subject for the decoration of seven arches was Shakespeare's "Seven Ages." The tesseræ of the mosaic are of enamelled baked clay instead of glass.

We have often wondered why mosaic was not more often used in the decoration of our public buildings. No doubt the matter of time involved in its installation has much to do with a reluctance upon the part of architects to use it more freely. The work in the Detroit Library is so beautiful and appropriate for special spaces that we shall expect to see an American renaissance of the art. The setting of the mosaics in Detroit was done by young girls, under the direction of Mr. Wiley and Mrs. Stratton with the true spirit of the old craftsmen.

The library contains many notable examples of the bronze workers' art.

First and foremost among these are the impressive sculptured bronze main-entrance doors, standing over fif-

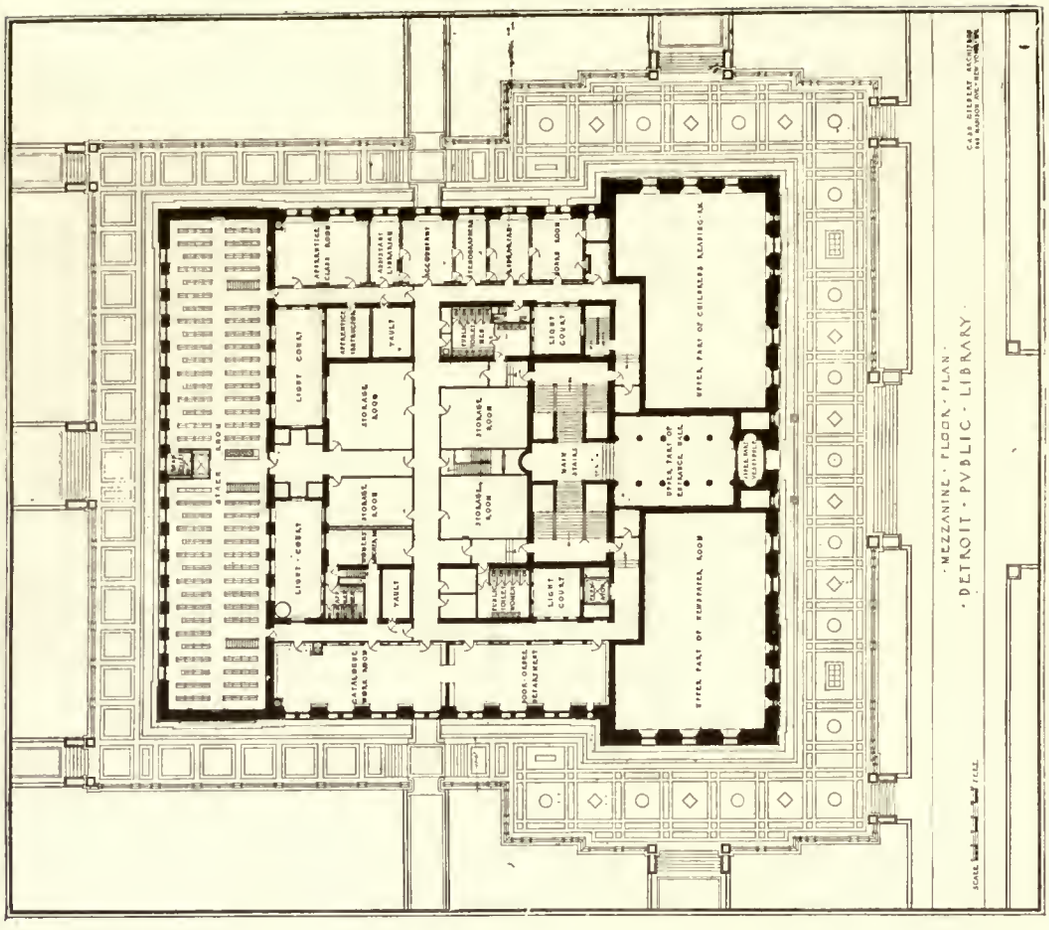
(*Continued on page 211.*)

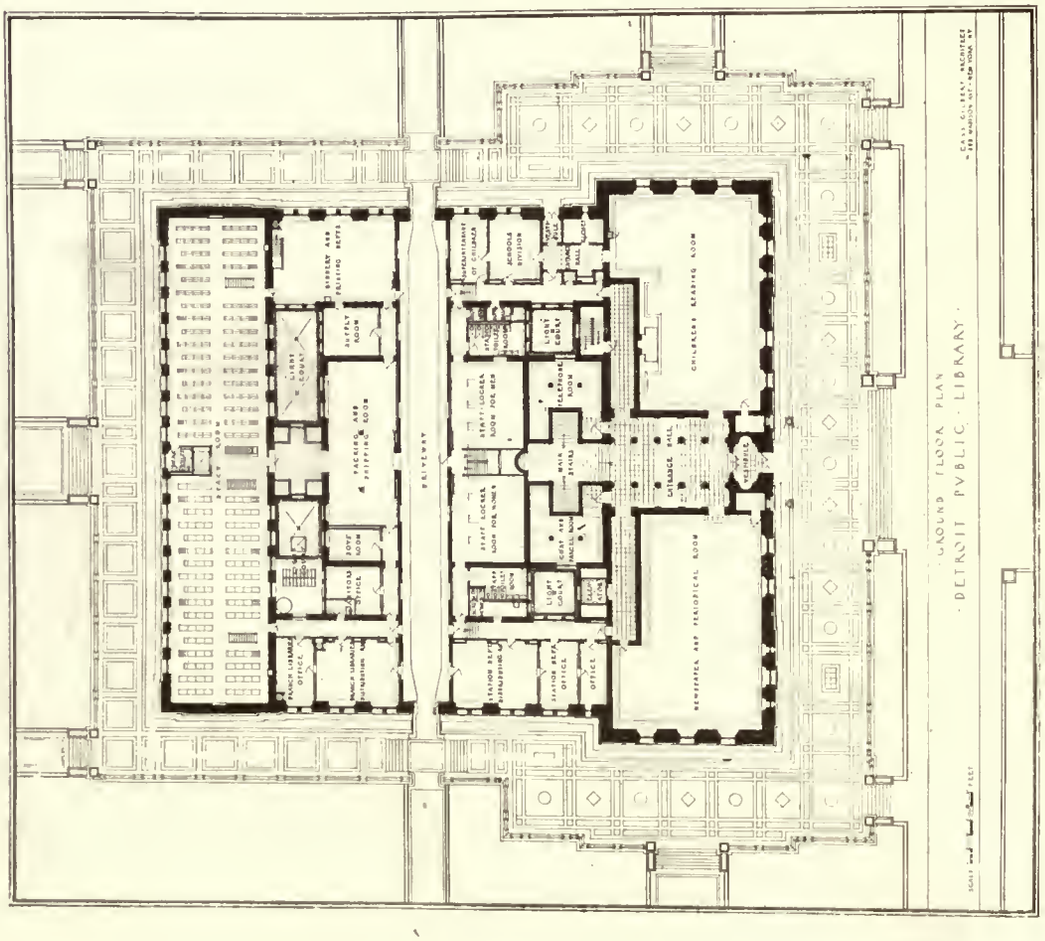
MUSIC AND DRAMA ROOM.

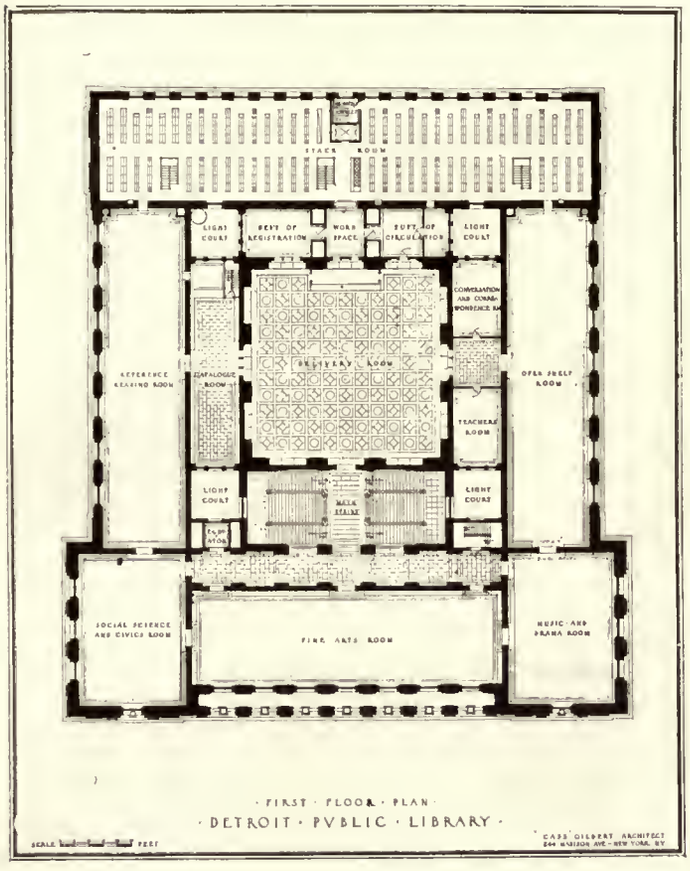
OPEN-SHELF ROOM.

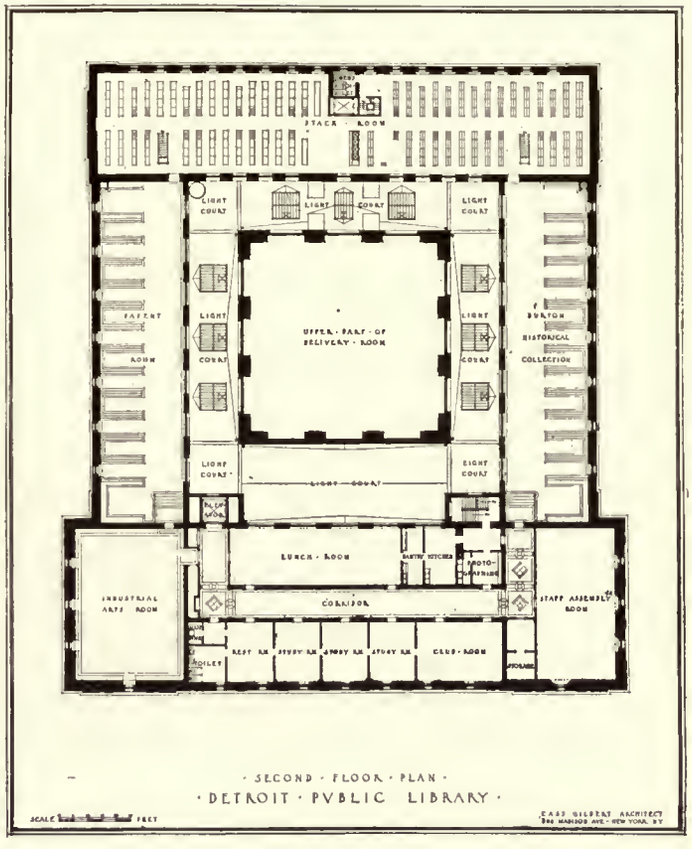
THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Cass Gilbert, Architect.


MEZZANINE · FLOOR · PLAN ·
· DETROIT · PUBLIC · LIBRARY ·
STACK ROOM
LIGHT COURT
STORAGE ROOM
VAULT
WAIN STAIRS
UPPER PART OF CHILDREN'S READING ROOM
UPPER PART OF NEWSPAPER ROOM
CATALOGUE WORK ROOM
DOOR-ORDER DEPARTMENT


GROUND FLOOR PLAN
· DETROIT PUBLIC · LIBRARY ·
STACK ROOM
PRIVEWAY
CHILDREN'S READING ROOM
NEWSPAPER AND PERIODICAL ROOM
LIGHT COURT
STATION DEPT. OFFICE
OFFICE





(*Continued from page* 208.)

teen feet in height, depicting in bas-relief the five phases of the ancient Grecian and Roman literature—epic, tragic, lyric, philosophic, and comic.

Mr. Donnelly, the sculptor, gives the following description of the significance of the panels:

Greek

Epic: Aged Homer, as blind bard reciting epic poetry. *Tragic:* Reception of Æschylus at court of Hiero, King of Sicily. *Lyric:* Sappho teaching the maidens of her school. *Philosophic:* Aristotle walking with the young Alexander as he teaches him. *Comic:* Aristophanes reclining, writing on tablets. Comic mask and pail (capsa) of papyrus rolls by couch.

Roman

Epic: Virgil receiving honors from the Emperor Augustus. *Tragic:* Seneca teaching the young Emperor Nero at the age of fourteen. *Lyric:* Horace reading his works to his patron Mæcenas. *Philosophic* (St. Ambrose): The baptism of Augustine at Cassiacum, at age of thirty-two. *Comic:* Young Terence, on stool, reading his first play to middle-aged Cæcilius, who reclines at dinner.

At either side of the main entrance and on the lower steps can be found four large bronze candelabra of exceptional beauty, in different designs.

The bronze main elevator enclosures on the different floors are distinctive in design and striking in their simplicity.

The five entrances to the delivery-room are surmounted by highly decorative bronze entablatures, the frieze containing the book-marks of different noted publishers. Each entrance is composed of three openings, divided by elaborate bronze pilasters and columns with rich Corinthian capitols. The entire decoration of this bronze is executed in very low relief, of soft and delicate feeling.

The bronze gates at the driveway entrances are particularly interesting, representing hand-forged work, fashioned after the manner of the craftsmen of the Middle Ages.

Such artistic bronze work, as described above, will be found at many other places in the building. Bronze is inseparably associated with the beautiful, and through its medium the creative genius of architect and sculptor can express itself as in no other material. Mr. Gilbert has skilfully distributed his bronze to contrast with the different textures of other bolder materials, obtaining by the avoidance of monotony in color and detail a most harmonious and desirable result.

He has expressed his belief that the bronze in the library is the most beautiful example of such work in this country.

In design and execution it is admirable and marks the development and progress of the bronze industry in this country, which now has reached the high standard established by the best craftsmen of the Old World.

The exterior of the building is entirely of Vermont marble, while selected Tennessee marble was used throughout for all interior memorial features, excepting the delivery-room, the walls of which are of antique rustic limestone, tooled. The pattern floors and solid treads are of Roman travertine stone.

The execution of the architect's designs and complete freedom in selection of the interior stone and marble were intrusted to the Johnson Marble Company, and the results will be recognized as the work of true artisans.

SOCIAL SCIENCE AND CIVICS ROOM.

FINE ARTS ROOM.

THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Cass Gilbert, Architect.

Editorial and Other Comment

As Others See Us

IN a gathering of men and women interested in the arts, and in architecture especially, we should, no doubt, hear, as a matter of course, more or less heated arguments for and against our high buildings. They afford a never-ending topic, and the last giant is no sooner completed than a new one rises up to confuse the prophets.

If we can be said to have a national architecture, it is best manifested in our sky-scrapers. They have brought forth the wonder of our friends across the sea, and very often their derisive condemnation. Only now and then has some Englishman or Frenchman, with a vision beyond his traditions, looked up and seen both the genius and the art that gave the high buildings birth, and have made them symbols of American aspirations.

Who will deny their beauty in these days, or the imagination, the courage, the skill that have made them possible.

Yes, some are very ugly, but they are rather the exceptions. As a rule, they are surprisingly successful, and with the recent zoning restrictions regarding set-backs, about which Mr. Corbett spoke so interestingly at the Institute Convention in Washington, the problem has been greatly complicated.

We have been reading lately some impressions of our architecture and other things by two visiting Englishmen. The visiting Englishman has been and still is sometimes a bit too prone to show America the way rather than to follow on, but times have changed since Mrs. Trollope and Dickens.

W. L. George, in his new book, "Hail, Columbia!" bases the success of our high buildings upon the discovery of reinforced concrete:

"Then came America and ferro-concrete. America discovered the natural use of the new material, and she discovered height. Americans have often told me that I am wrong; they argue that the origin of the sky-scraper is to be found in the small size of Manhattan and the cost of land. That is not true, for the sky-scraper is not confined to Manhattan. You find it in Boston, Chicago, even in Oklahoma, where land is not worth a nickel a foot. The truth is that American architects, who went for their training to Paris, had the fit of exaltation which in other times produced the great styles. That is how they made the style of the present, and it is magnificent. Some of the tall buildings are bad, some good. The architect has not everywhere equalled his dream, but in general he has all the time kept a firm hold on utility, the only safe companion for the man who builds. He has wasted no time and no money on the scrolls and garlands which disfigure English building, he has not broken up his noble columns at all except to support something. So far as possible (that is, after compromising with the demand for plate-glass gro[illegible]d floors) he has made honest use of his material. Ar[illegible] so, by long lines, by avoiding fret, he has produced nobility. The Woolworth, the Wurlitzer, its neighbor, the Bush Terminal—all these, though rather elaborate, are clean-lined and good. Lit up at night, the Bush Terminal is a fairy castle in the air. The Commodore Hotel is perhaps the most magnificent of all because it is less narrow, has more dignity, and, because its use of two materials, is light and gay.

"They mean something in terms of aspiration. It is not business alone which piles brick upon brick so fast opposite my window that every week a complete floor is built. Business thinks that it hires the architect, just as it thinks that it tolerates the poet, but the architect and the poet know better. In matters of art they always come through. The business men are too busy to watch over their own version of beauty, so the artist comes in and imposes his own."

William Archer, the theatrical critic and playwright, who spent a large part of the winter in New York, and who has been "in our midst" many times before, pays our architecture an even higher compliment, and somehow we like the way he writes about us in general rather better. He knows us better, evidently, as evidenced in what he said in an article on "The Great Stupidity," in a recent *Atlantic*. He includes in his list, we notice, Mr. Gilbert's beautiful Detroit library:

"But 'elevator architecture,' though the most prominent feature of New York and other American cities, is not the only evidence of the constructive genius of the race. In every type of building America leads the world. The finest railway stations in Europe—Frankfort, Cologne, and the Paris Gare d'Orléans—are paltry in comparison with these vast palaces of marble and travertine, the Pennsylvania and the Grand Central termini, with the Union Station at Washington not far behind them. Each of the great New York stations is a city in itself. There has been nothing like them in the world since the Baths of Diocletian or of Caracalla. The Library of Congress and the Public Libraries of New York and Boston are stately and splendid beyond comparison; and even Detroit, which holds only the seventh place among American cities, is housing its library in a superb white-marble palace. In domestic architecture, again, America easily holds the first place, having gone ahead with giant strides during the past quarter of a century. The typical brownstone dwelling of old New York was cramped, stuffy, and inconvenient. To-day the country or suburban homes, even of people of quite moderate means, are models of convenience and comfort—the abodes, in every sense, of the highest civilization."

Now we like this appreciation, of course, and we agree with our English friends, and are glad we are discovered. All this sort of thing is good for what ails us, and may we go on building on a mutually sincere, friendly, and *understanding* foundation a structure that is going to give the strength of steel and the endurance of granite to the peace of the world.

The Detroit Library

IT is with especial pleasure that we present in this number Mr. Gilbert's beautiful Detroit library. We feel sure our readers will welcome it as another notable contribution by this master designer to our national architecture, another in the series of noble buildings that we owe to his genius and breadth of view. It is of great distinction in its impressive mass and fine balance of proportions and as well in its finely chosen and appropriate details. That it is admirably planned for its purposes is evident and witnessed by Mr. Strohm's appreciation. There is a fine simplicity pervading it, too, that carries out the idea it embodies of being a storehouse for the treasures of the mind, a monument to enclose the things that endure, the thought of all the ages, all the world.

The Competition for the Kansas City Liberty Memorial

THE competition for the Liberty Memorial, Kansas City, Mo., has been won by H. Van Buren Magonigle, of New York City. Mr. Thomas R. Kimball, vice-president of the American Institute of Architects, was the professional adviser of the committee. Ten local architects were in the competition, and four outsiders. The latter included Bliss & Faville, of San Francisco; Paul Cret, of Philadelphia, associated with Zantzinger, Borie, & Medary; Bertram G. Goodhue, of New York, and Mr. Magonigle. The jury was composed of Louis Ayres, of York & Sawyer, Henry Bacon, James Gamble Rogers, John Donaldson, of Detroit, Walter F. Willcox, of Seattle. Mr. Willcox was chosen by the commission, Mr. Ayres by the four outside competitors, Mr. Rogers by the Kansas City competitors, and Mr. Bacon by the above three. Mr. Donaldson's name was added by the commission, a new idea in competition juries.

Requirements for Membership in the Institute

REQUIREMENTS for Membership in the American Institute of Architects' Exhibits are not required from:

Graduates in architecture of the Massachusetts Institute of Technology, Columbia University, University of Pennsylvania, Cornell University, Harvard University, the University of Illinois, the University of Michigan, Carnegie Institute of Technology, the University of California, Washington University, Syracuse University, the University of Minnesota, the University of Oregon, and the University of Kansas.

Or from those who have held accredited scholarships of the American Academy at Rome, Columbia University, Cornell University, the Pennsylvania Academy of Fine Arts, Washington University, or holders of the Rotch, McKim, or Stewardson Scholarships, the winners of the Paris Prize of the Society of Beaux Arts Architects or the Alumni Fellowship of the University of Pennsylvania; or from those who have passed the qualifying examinations of the Royal Institute of British Architects or the examinations for the first class of the École des Beaux Arts.

The Architectural Club of New Haven, Conn., held an important meeting recently at its club-rooms on Chapel Street. President Theodore O. Appel presided. There was a large attendance of the officers and members. A revision of the by-laws was thoroughly discussed and some changes were made in order to make provision for the rapid growth and future welfare of the club. An article was included in the by-laws providing for admission to active membership of non-resident architects. This will, no doubt, bring into the club representatives from other Connecticut cities, especially from Bridgeport and Waterbury. Hartford already has representatives on the membership and will probably contribute more. The subject of the club's outings was considered. Provision was made for the recreation of the members for the summer months. Plans for next year's exhibition were formulated and an additional committee was provided, of which Mr. A. W. Boylen is chairman, so that there will be a still more comprehensive exhibit than the one recently held in the Free Public Library. For the coming meetings of the club educational lectures will be provided and the entertainment committee is planning an attractive programme.

Sound Business Doctrine

"WHY do you advertise when you are behind in deliveries? This seems to be a very natural question," says the Joseph Dixon Crucible Co., "and the answer involves the discussion of a vital policy of this business—a policy that is fundamental.

"If we were building a business for to-day our policy would vary from day to day with the temporary changes with which every business has to contend.

"But we are building for the time to come, and we hope that this business will become many times greater than it is to-day. Without the proper foundation it would undergo violent changes dependent upon temporary national, local, or even imaginary conditions.

"If we should permit ourselves to become inflated with self-confidence when business conditions are favorable, restricting our selling and advertising activities, and go down in the dumps when conditions are not so favorable, this business would not amount to any more than the existing conditions would make of it.

"We say right now, without reservations, that we hope, regardless of how aggressive and efficient our manufacturing department may be, that it will never be able to catch up with our selling organization.

"If our efforts should be halted in the middle of the road in times of liberal buying to wait on the manufacturing department, there might come a time when the manufacturing department would have to suspend operations while waiting on the sales organization.

"With such a policy we would be running around in a circle, disorganizing one day and reorganizing the next.

"The greater the demand for our product, the quicker the turnover for merchants; and the more frequent the turnovers, the larger is the volume of profit.

"In this business advertising is a sales policy—the same as our policy maintaining a sales organization—and we might as well consider the elimination of one as the other. Neither will be eliminated, as this business needs both if we are building for the future.

"We hope the idea will never creep into this organization that there will be any let-up in aggressive methods, which might suggest that when business is good there is not occasion for work, and when business is poor it is too hard to get.

"We constantly have in mind that the American people are much more concerned in their own affairs than in ours, and if we should restrict our selling and advertising activities they will begin to forget us—and this would be our fault.

"We are going ahead with the idea of increasing the present momentum in favor of our goods; and if conditions should turn face about, our dealers and ourselves will be in a better position to hurdle obstacles than if we originated a policy for each condition as it arose."

WOODWARD AVENUE FAÇADE, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Cass Gilbert, Architect.

REAR (SHOWING STACKS), THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Cass Gilbert, Architect.

DETAIL OF FAÇADE, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.

DETAIL OF CORNER, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

Cass Gilbert, Architect.

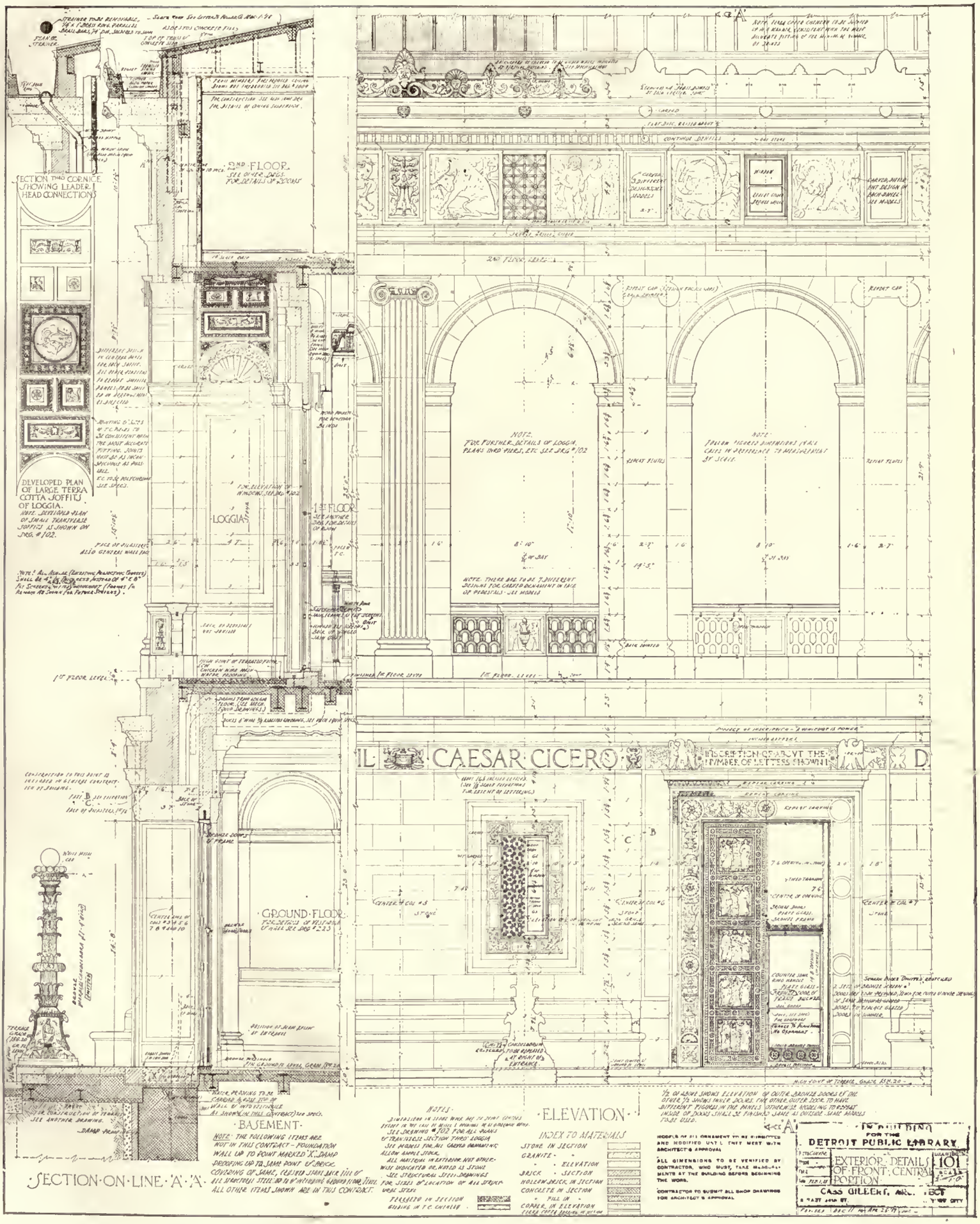
ENTRANCE-HALL, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.

MAIN STAIRCASE, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.

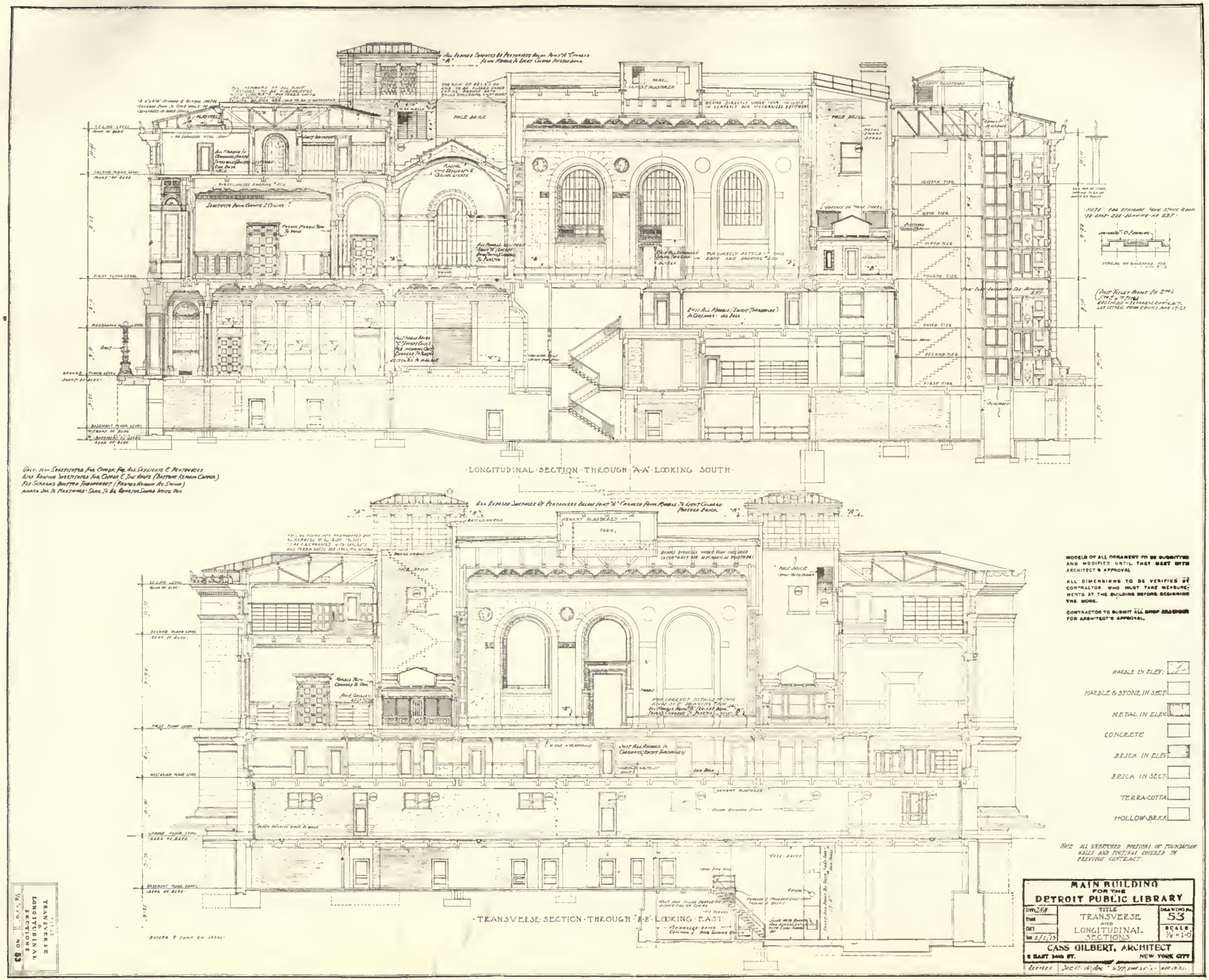
CORRIDOR, FIRST FLOOR, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.

DELIVERY-ROOM, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

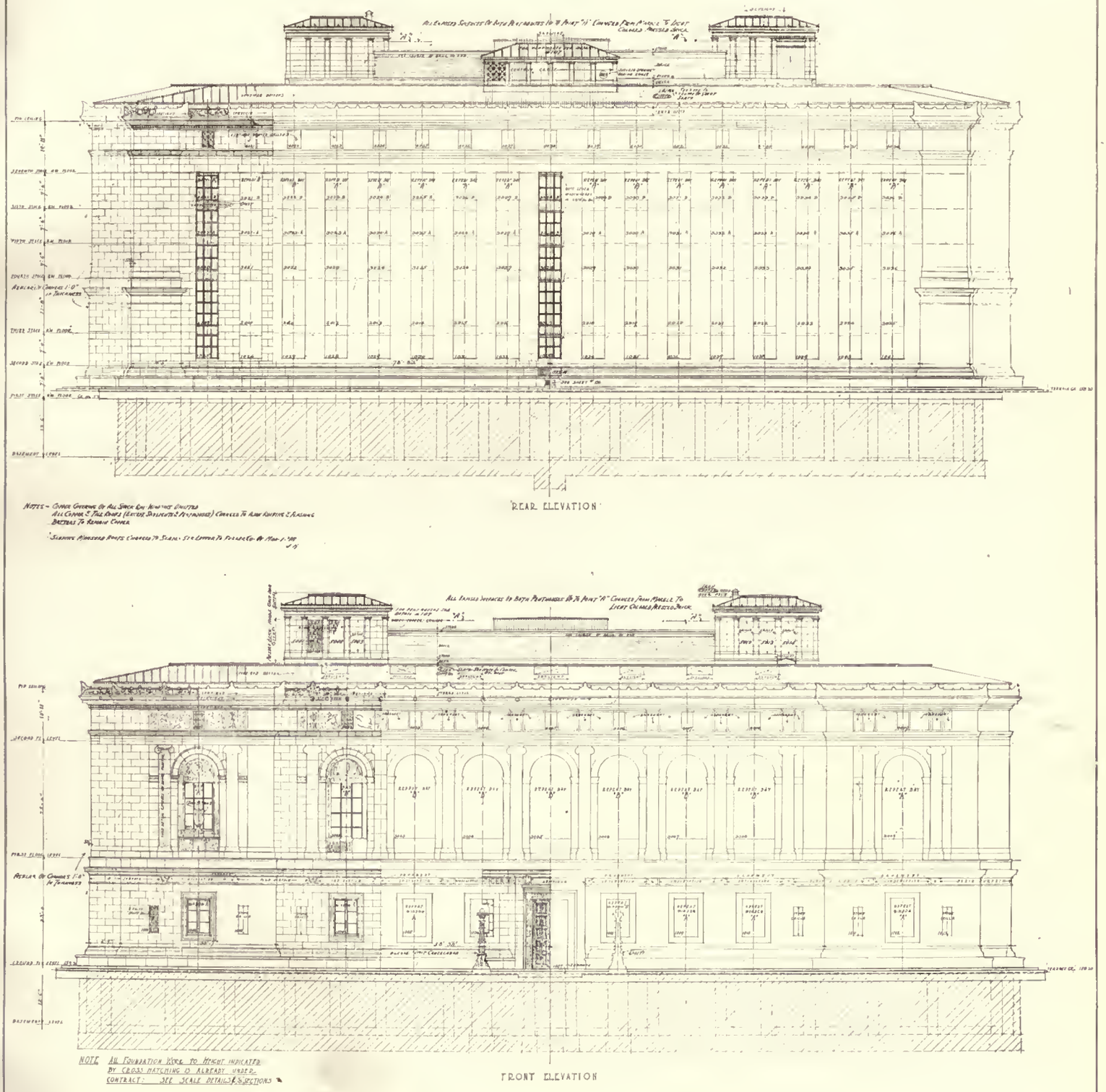
Cass Gilbert, Architect.


SECTION THRO CORNICE SHOWING LEADER HEAD CONNECTIONS
2ND FLOOR
SEE OTHER DRGS. FOR DETAILS OF ROOMS
DEVELOPED PLAN OF LARGE TERRA COTTA JOFFITS OF LOGGIA
LOGGIA
1ST FLOOR
GROUND FLOOR
NOTE. FOR FURTHER DETAILS OF LOGGIA, PLANS THRO FIXES, ETC. SEE DRG. #102
NOTE. THERE ARE TO BE 7 DIFFERENT SECTIONS FOR CARVED ENRICHMENT IN FACE OF PEDESTALS - SEE MODELS
NOTE. FIGURED DIMENSIONS ONLY ARE TO BE ADHERED TO. ALL OTHERS TO BE SCALED.
INSCRIPTION - CARVED THE NUMBER OF LETTERS SHOWN
IL · CAESAR · CICERO
SECTION · ON · LINE · 'A' · 'A'
· BASEMENT ·
· ELEVATION ·
INDEX TO MATERIALS
STONE IN SECTION
GRANITE - "
" - " ELEVATION
BRICK - SECTION
HOLLOW BRICK IN SECTION
CONCRETE IN SECTION
" FILL IN "
COPPER IN ELEVATION
NOTES
TO BUILDING FOR THE DETROIT PUBLIC LIBRARY
EXTERIOR DETAILS OF FRONT CENTRAL PORTION
CASS GILBERT, ARCH.
101

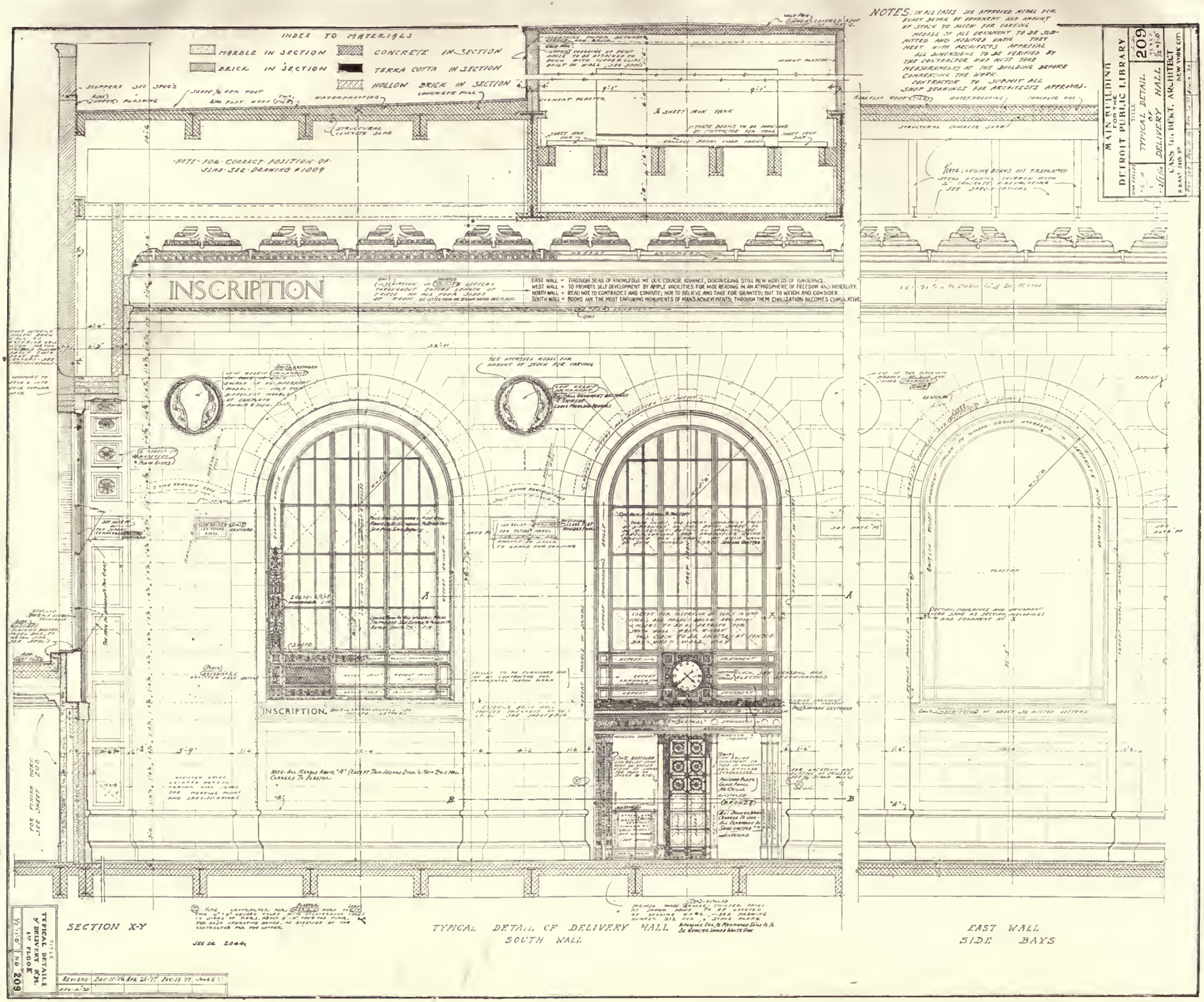
DETAIL, FRONT CENTRAL PORTION, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.



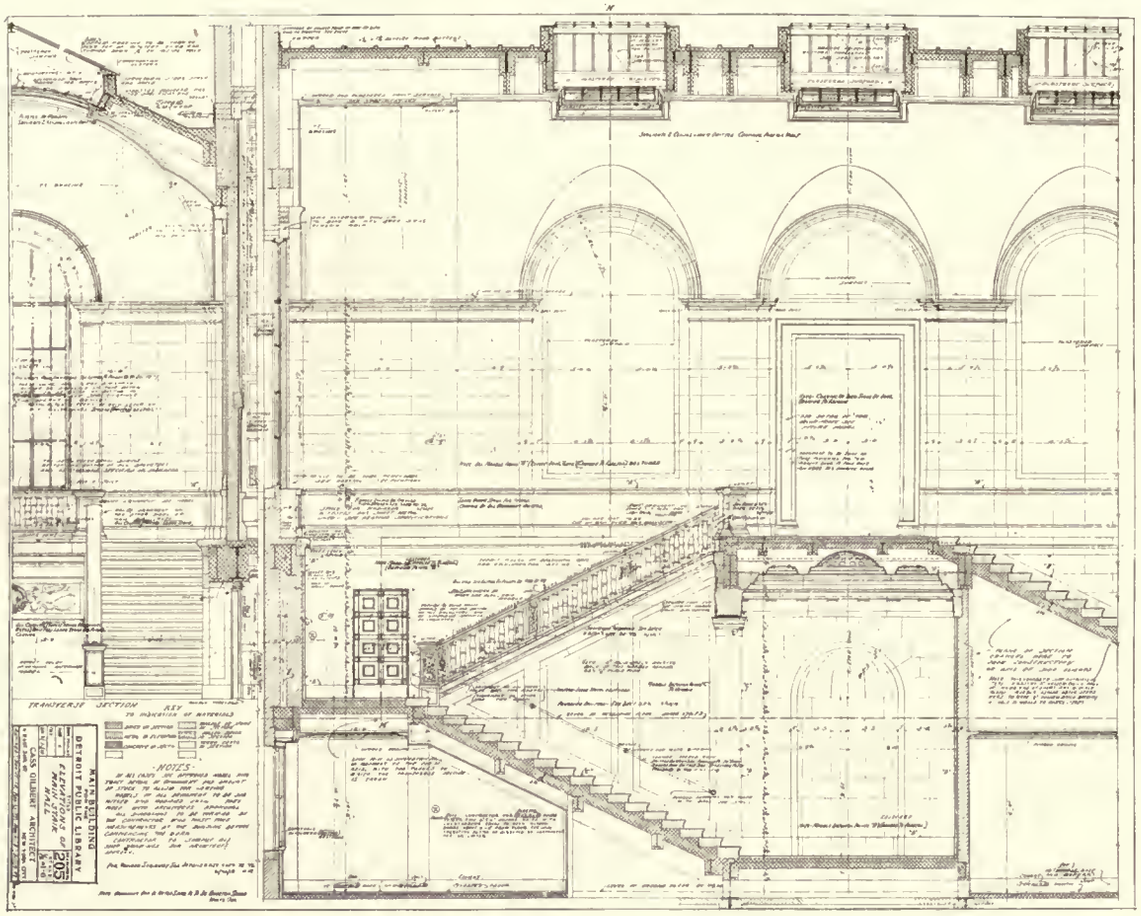
TRANSVERSE AND LONGITUDINAL SECTIONS, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.



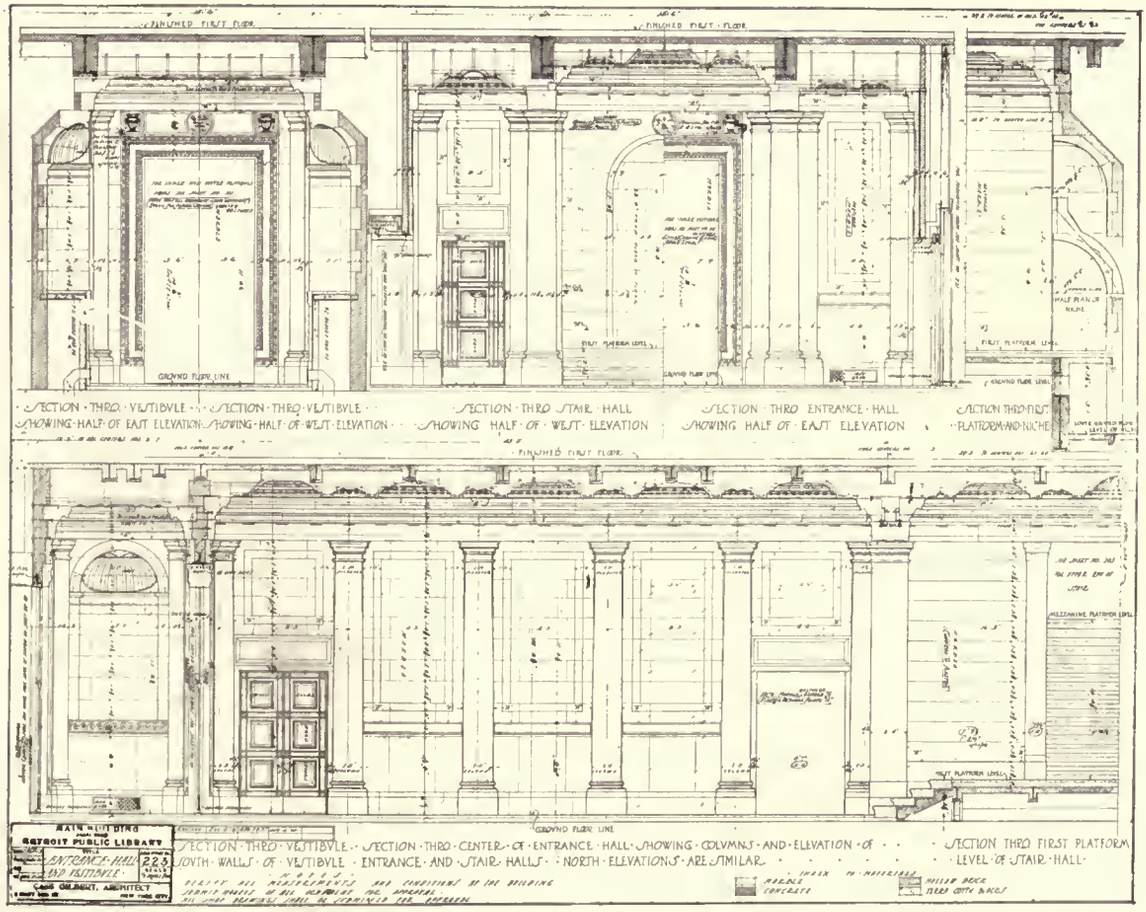
FRONT AND REAR ELEVATIONS, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.


INDEX TO MATERIALS
MARBLE IN SECTION
BRICK IN SECTION
CONCRETE IN SECTION
TERRA COTTA IN SECTION
HOLLOW BRICK IN SECTION
NOTES: IN ALL CASES SEE APPROVED MODEL FOR EXACT DETAIL OF ORNAMENT AND AMOUNT OF STOCK TO ALLOW FOR CARVING
MASTER OF ALL ORNAMENT TO BE SUBMITTED AND MODIFIED UNTIL THEY MEET WITH ARCHITECT'S APPROVAL
ALL DIMENSIONS TO BE VERIFIED BY THE CONTRACTOR WHO MUST TAKE MEASUREMENTS AT THE BUILDING BEFORE COMMENCING THE WORK.
CONTRACTOR TO SUBMIT ALL SHOP DRAWINGS FOR ARCHITECTS APPROVAL.
MAIN BUILDING FOR THE DETROIT PUBLIC LIBRARY
TITLE TYPICAL DETAIL OF DELIVERY HALL
CASS GIL BERT, ARCHITECT NEW YORK CITY
209
INSCRIPTION
EAST WALL = THROUGH SEAS OF KNOWLEDGE WE OUR COURSE ADVANCE, DISCOVERING STILL NEW WORLDS OF IGNORANCE.
WEST WALL = TO PROMOTE SELF DEVELOPMENT BY APPLE FACILITIES FOR WISE READING IN AN ATMOSPHERE OF FREEDOM AND MORALITY.
NORTH WALL = READ NOT TO CONTRADICT AND CONFUTE; NOR TO BELIEVE AND TAKE FOR GRANTED; BUT TO WEIGH AND CONSIDER.
SOUTH WALL = BOOKS ARE THE MOST ENDURING MONUMENTS OF MANS ACHIEVEMENTS; THROUGH THEM CIVILIZATION BECOMES CUMULATIVE.
INSCRIPTION
SECTION X-Y
TYPICAL DETAIL OF DELIVERY HALL SOUTH WALL
EAST WALL SIDE BAYS

DETAIL, DELIVERY-HALL, THE DETROIT PUBLIC LIBRARY, DETROIT, MICH. Cass Gilbert, Architect.



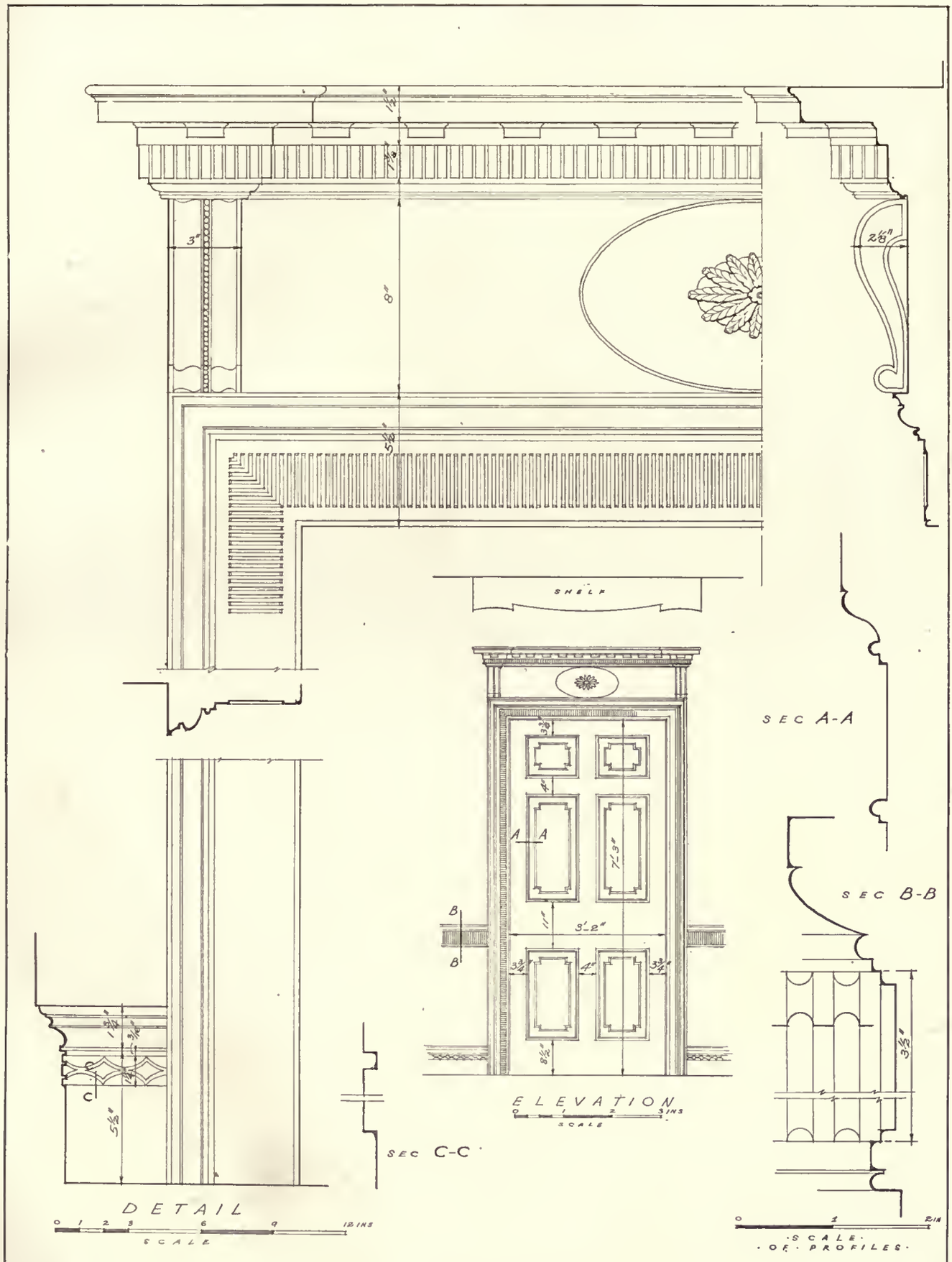
ELEVATION OF MAIN STAIR HALL.


SECTION THRO VESTIBULE SHOWING HALF OF EAST ELEVATION
SECTION THRO VESTIBULE SHOWING HALF OF WEST ELEVATION
SECTION THRO STAIR HALL SHOWING HALF OF WEST ELEVATION
SECTION THRO ENTRANCE HALL SHOWING HALF OF EAST ELEVATION
SECTION THRO FIRST PLATFORM AND NICHE
SECTION THRO VESTIBULE SOUTH WALLS OF VESTIBULE
SECTION THRO CENTER OF ENTRANCE HALL SHOWING COLUMNS AND ELEVATION OF ENTRANCE AND STAIR HALLS NORTH ELEVATIONS ARE SIMILAR
SECTION THRO FIRST PLATFORM LEVEL OF STAIR HALL
DETROIT PUBLIC LIBRARY
ENTRANCE HALL AND VESTIBULE
CASS GILBERT, ARCHITECT

DETAIL, ENTRANCE–HALL AND VESTIBULE. Cass Gilbert, Architect.

THE DETROIT PUBLIC LIBRARY, DETROIT, MICH.

214-14

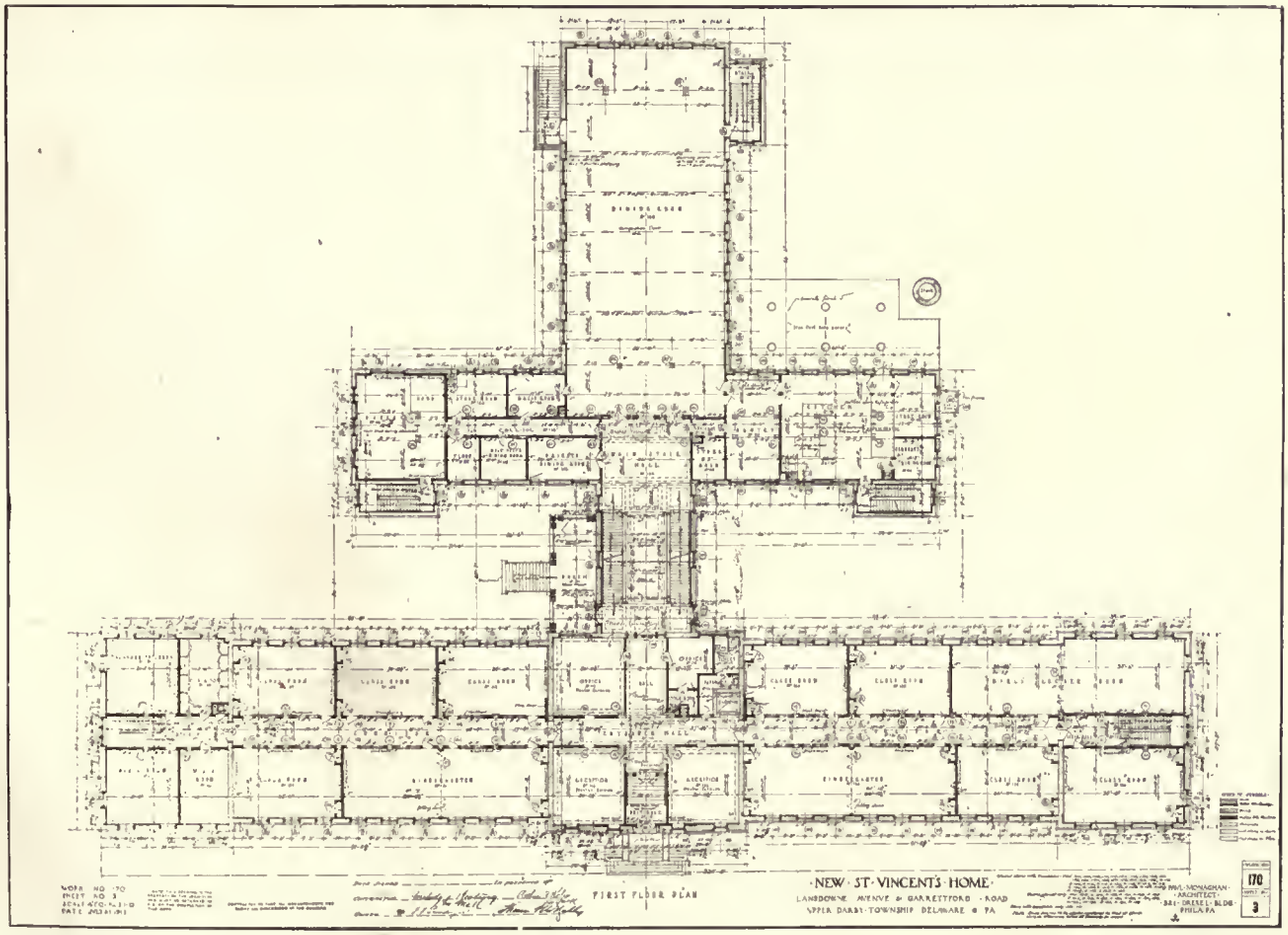


EARLY ARCHITECTURE OF SOUTH CAROLINA

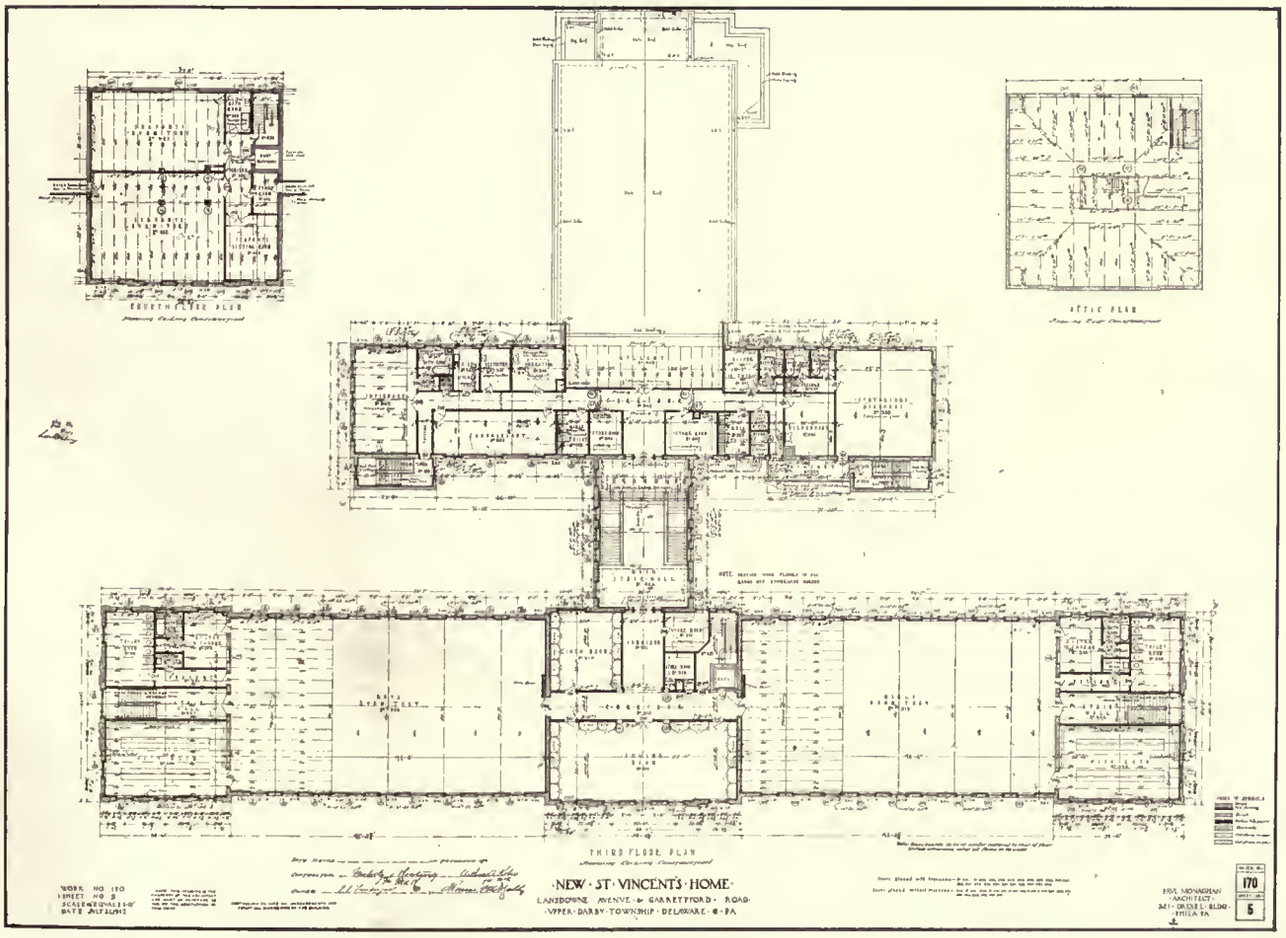
INTERIOR DOORWAY IN AN OLD INN

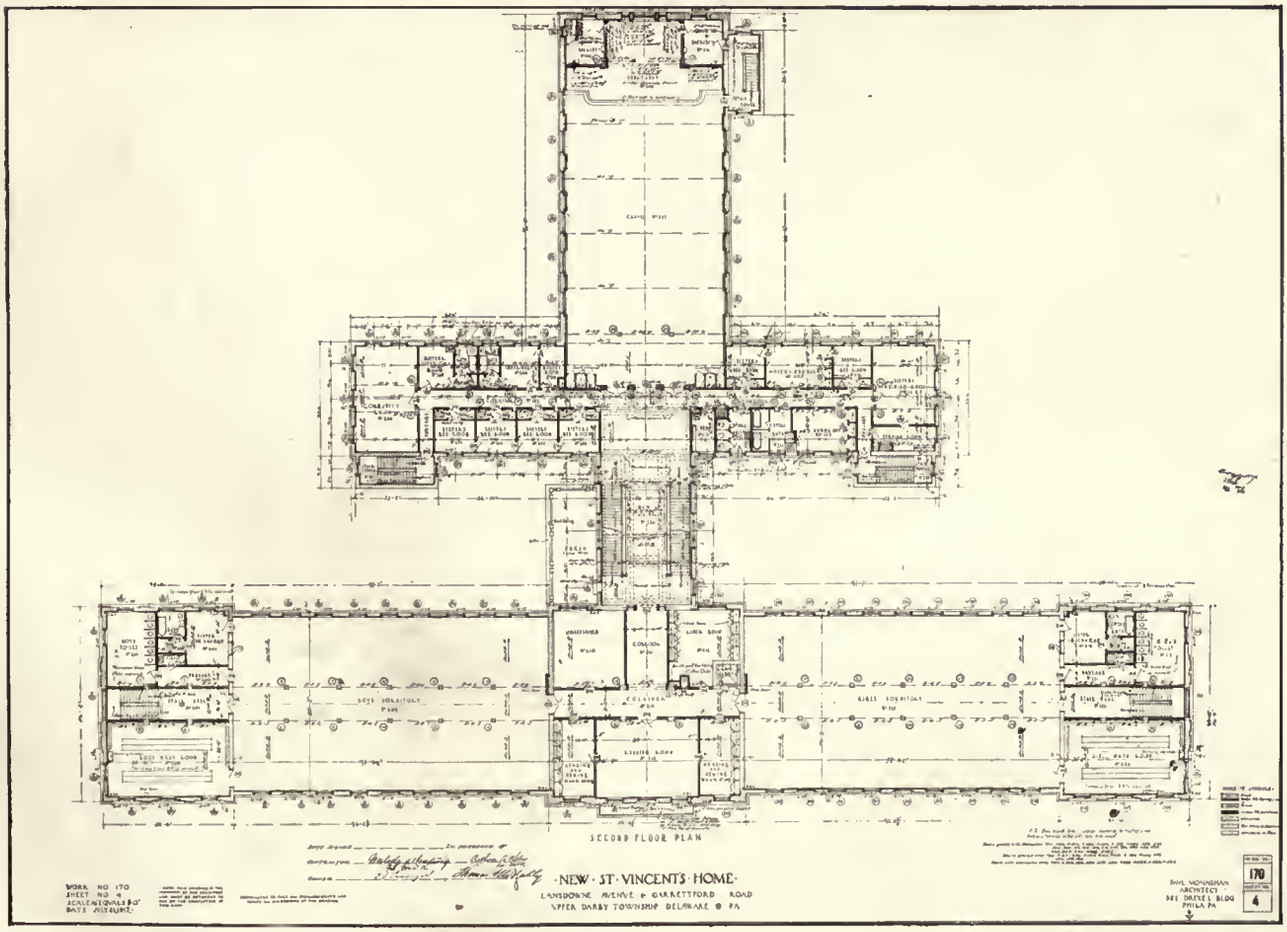
BEAUFORT, S. C.

MEASURED BY. DWIGHT JAMES BAUM
DRAWN BY VERNA COOK SALOMONSKY



NEW SAINT VINCENT'S HOME, DELAWARE COUNTY, PA. . Paul Monaghan, Architect.


ATTIC PLAN
THIRD FLOOR PLAN
NEW · ST · VINCENT'S · HOME
LANSDOWNE AVENUE & GARRETTFORD ROAD
UPPER DARBY TOWNSHIP · DELAWARE CO · PA
170
5



NEW ST. VINCENT'S HOME, DELAWARE COUNTY, PA. Paul Monaghan, Architect.

The Modern Conception of Baroque Architecture

By Albert C. Phelps

College of Architecture, Cornell University

FROM A LECTURE GIVEN AT THE METROPOLITAN MUSEUM OF ART, NEW YORK

JUST a word must be said about Lecce, down in the Heel of Italy, where we have an almost totally Baroque provincial city of great charm. The present Préfecture, formerly a Celestine monastery, illustrates the fanciful seriousness of the local style.

The early eighteenth-century Royal Palace at Caserta, some twenty miles north of Naples, might well form the basis of a discourse upon the Baroque style, with its splendid scale, ingenious plan, and magnificent internal features, the finest of which is the grand staircase.

Rome. Fontana di Trevi (1735). The central part by Niccolo Salvi, the Neptune with the sea-horses by Pietro Bracci.

The front of Syracuse Cathedral suggests the pomp and magnificence as well as the questionable taste that is to be encountered in many Sicilian works of the time.

Florence displays fewer Baroque works than most Italian cities; yet even here the Princes' Chapel of San Lorenzo shows how the spirit of ostentatious display had invaded the cradle of the Renaissance early in the seventeenth century.

The work at Genoa illustrates the difficulty of drawing a sharp line of demarcation between what are commonly called Renaissance and the Baroque works; for in the palaces and villas of Alessi, as well as in those of Bianco and others, one sees the fanciful charm of detail combined with masterly composition of plan that have made the Genoese work unique, if not unapproachable.

The best-known Baroque work in Venice is the Church of the Salutation, built by the Venetian Senate as a thank-offering upon the cessation of the plague that caused the death of a third of the population in the seventeenth century. Standing superbly, near the mouth of the Grand Canal, it has been sketched, painted, and etched by artists innumerable, and has been lavishly praised and violently denounced by critics, according as they sympathize with or misunderstand its purpose. Ignored it will not be. As a spontaneous and joyful outburst of thanksgiving it is a splendid expression of the religious enthusiasm of the time. Picturesque, even oriental in mass, it displays the utter disregard of structural propriety so frequent in Baroque works, and emphasizes Venice's constant debt to the East. Doubtless it has many faults in composition and detail, but like all vital works, it rises above technical criticism, and will delight the heart of the lover of the beautiful when less daring but more correct works have been utterly forgotten.

San Moisé has withstood the attacks of literary and architectural purists, and while it has justly been described as "an orgy of decoration," it fails to shock one as it should; indeed, the carving is so lightly handled and so well placed that its inappropriateness seems partly excusable.

Mr. Howells's "literary humbug," "The Bridge of Sighs," is an imaginative and beautiful work connecting the prison with the Ducal Palace. Perhaps the dramatic element, appropriate to such a structure, may have been suppressed unduly in favor of the purely decorative, yet the idea of secrecy and despatch are incorporated, and Venetian tradition, even to the employment of pierced screens rather than windows, has been maintained.

A controversy might arise if one pronounced the great State apartments of the Ducal Palace unqualifiedly Baroque.

(*Continued on page 218.*)

Genoa. University (1628). By Bartolomeo Bianco. Court.

VENICE. S. MARIA DELLA SALUTE (1631–1656). BY BALDASSARRE LONGHENA.

MURCIA (952). FACHADA PRINCIPAL DE LA CATEDRAL.

(*Continued from page 216*)

Yet are they not in magnificence and in decorative detail closely allied to the interiors of the seventeenth century? As Michael Angelo's Sistine Chapel decorations supplied the motive for a series of inferior imitations, so these splendid interiors were used as a source of inspiration by many decorative artists of the seventeenth and eighteenth centuries in the palaces and villas in Venetian territory.

Church furniture, alone, exhibits vividly the masterly skill in handling and the inappropriateness of choice of decorative elements in much Baroque work. The choir-stalls of St. Giorgio at Venice and a confessional in St. Andrea at Vercelli, illustrate this.

Plastic details applied to vaults and ceilings indicate great inventive fertility on the part of the Baroque artist and illustrate the generally high standard maintained during what has all too frequently been dismissed as the "period of debasement."

The design of theatres occupied the attention of some of the ablest artists of the eighteenth century. The Civic Theatre of Bologna, built by Antonio Bibbiena, is the finest example.

Baroque architecture obtained an easy foothold in many German and Austrian cities. The predilection for the picturesque and fantastic in the Early German Renaissance paved the way for the grandiloquent yet often pleasing architectural expression of the later period. Italian influence was especially strong at Innsbruck and Prague. The Catholic Casino at Innsbruck exhibits characteristics closely allied to those of the contemporary architecture of Turin, but modified by local taste.

The great Church of the Theatine Monks at Munich illustrates the type usually credited to the Jesuits. It is largely the work of an Italian architect. Externally the only peculiarly local note is seen in the extraordinary cupolas of the towers. These are an exaggerated form of the "*zwiebel gewölbe*," or "onion dome," so frequent, and often charmingly handled, in the parish churches of Upper Bavaria. The interior is typical of the larger churches of the period, and is marred only by the altars and their immediate surroundings.

Würzburg, Salzburg, and Vienna are excellent places to study the German Baroque style; in fact, interesting examples are to be found in nearly all the lesser towns, as well as the more important centres of South Germany and Austria.

While at Vienna the Italian influence may be observed, the local style became especially strong, and the works of two men, father and son, Johann Bernhard and Josef Emanuel Fischer von Erlach, are particularly notable. The Church of St. Charles Borromeus, the greatest work of the pair, was erected—as was the Church of the Salutation at Venice—to commemorate the cessation of a plague. It exhibits a strange combination of the unconventional in plan and mass with both Baroque and strictly classic details, even foreshadowing the classic revival in the isolated columns with spiral reliefs, based on Trajan's Column at Rome.

The domestic architecture of these men, and of von Hildebrandt, displays considerable originality and charm. The Schwarzenberg and Belvedere Palaces are among the best known, and illustrate the intermixture of a species of Rococo detail with the more formal designs.

Spanish Baroque architecture is second only, and, in some respects, not at all inferior, to the Italian. The Spanish taste was peculiarly favorable to the Baroque movement, and the Jesuit Order, by whose name the whole style has been designated, originated in Spain.

As in Germany, the picturesque composition of the Early Renaissance—known in Spain as the Plateresque—persisted in some of the later works. Murcia Cathedral illustrates in its bizarre and startling façade with its bold and sensuous sculpture, deep shadows and striking silhouettes, the ultra-Baroque phase of Spanish architecture. Strange and fantastic it is to Northern eyes, but in the brilliant sunlight of the South, seen against a deep-blue sky, often among orange or palm trees, one must admit the fascination of its charm. Murcia's tower illustrates also the unrivalled success of Spanish architects in this field of design.

The west façade of the great pilgrimage church of Santiago de Compostella is perhaps the finest Baroque work in Spain. The general effect is not unlike that of the late Gothic. The soaring lines of the towers, the steep gable, and the delicate ornament are more in sympathy with the mediæval building behind than one might think possible; while the splendid scale, excellent proportions, and charming silhouettes combine to make this a truly great work.

The Sacristy of the Carthusian Monastery at Granada shows what could be done in the application of irrelevant and profuse ornament to an otherwise impressive interior. Indeed, this seems to illustrate the persistence of the oriental feeling in Spanish work, reminding one of the fantastic interior of some East Indian temple.

In the Western World the Spanish Baroque has produced some notable works, the most important, probably, being the Cathedral and Sacristy of the City of Mexico.

The Jesuit Church of St. Michael at Louvain is a typical Belgian Baroque work. As one might expect, the natural taste of the people, the traditions of their mediæval design, and the political domination of the Spaniards all conduced to the development of the Baroque with enthusiasm, if not always with notable success. In church furnishings, particularly in wood-carving, some admirable results were achieved. Rubens, the great painter, was essentially a Baroque artist, and his influence was both wide-spread and powerful.

The Baroque element began to appear in French architecture in the latter half of the sixteenth century in some of the works executed for Catherine de Medici. Under Henry IV, partly as a result of the influx of Flemish artists and craftsmen, and more especially on account of the very considerable Italian influence introduced by Marie de Medici, the Baroque gained a considerable ascendancy. The Medici Fountain in the Luxembourg gardens is a truly Baroque work. The Baroque tendency can be traced in many important buildings of the reigns of both Louis XIII and Louis XIV, but nowhere to better advantage than in the splendid Church of the Val de Grâce, begun by Anne of Austria as a thank-offering for the birth of Louis XIV. Here we have the Baroque at its best; recalling in a general way the Church of the Jesuits at Rome, but exhibiting no little originality and mastery of handling on the part of François Mansert, Lemercier, and finally Lemuet, its successive architects.

The Porte St. Denis is another fine Louis XIV work, Baroque in expression but truly national in spirit.

Bernini's visit to Paris in 1665, although considered a failure by that artist, in that he was not permitted to execute his design for a grandiose Roman palace in place of the Louvre which had been under construction for more than a century, did give a definite impetus to monumental design, particularly in planning. And this feature of the Baroque may be seen in such works as the Palace at Versailles that, because of regularity of composition and correctness of details, are rarely thought of as having been influenced by this movement.

Probably comparatively few architects, to say nothing

of cultured laymen, think of the Baroque as having appeared in the English Renaissance. Ignoring the earliest phases of the style, one can see in the works of Inigo Jones, such as the York Water Gate and his design for the front of the Old St. Paul's Cathedral, actual Baroque composition and details; while in such designs as that for the Palace at White Hall, the broad treatment of plan owes not a little to Italian Baroque precedent.

While Sir Christopher Wren never visited Italy and the Continental influence in his work is generally assumed to be French, the Baroque appears not in stereotyped fashion but as a spontaneous outburst of a great inventive designer in his church towers and steeples and purely monumental works.

If Wren's followers lacked his originality, nevertheless they preserved and at times exaggerated the monumental and even grandiose spirit, as in Blenheim Palace, the home of the Duke of Marlborough, by Sir John Van Brugh; and while James Gibbs displayed a greater knowledge of classic precedent and a propriety of detail not usual in the work of Wren, even he employed Baroque features, as in the beautiful spire of St. Martin's in-the-Fields.

Quite naturally this picturesqueness of composition and playfulness of detail was preserved in much of our Colonial work. Innumerable instances might be cited, though I have selected but two—the steeple of St. Paul's Chapel on lower Broadway and that of the Independent Presbyterian Church in Savannah, Georgia.

As was appropriate, on account of climatic conditions and local tradition, the Spanish Baroque was largely adapted in the design of the buildings for the Panama-California Exposition in 1915, and the style has been employed with varying degrees of success in numerous public and private buildings on the Western coast.

This summary and necessarily inadequate review of Baroque Architecture has been made with no intention of pleading for the revival of the letter of the style. Enough, however, I believe has been shown to indicate that it is by no means a barren field for study and suggestion; particularly in monumentality both of plan and mass, and occasionally in charm and piquancy of detail. If, however, we have succeeded in perceiving, to even a slight extent, that the old view of the Baroque as a style entirely debased and corrupt, lacking in originality and unworthy of serious consideration, has no place in a modern estimate of a great period of artistic activity, our effort has not been wholly lost.

Construction of the Small House

By H. Vandervoort Walsh

School of Architecture, Columbia University

ARTICLE XI

LIGHTING AND ELECTRIC WORK

Modern Developments

WHEN we talk of lighting the modern home, there is generally but one idea that enters our minds—electric lighting. Even those dwellings, remote from any power-house, are installing small generators in preference to the oil or gas lighting systems.

Then, too, when we refer to good lighting we no longer think of glaring bulbs of light, exposing all the harsh glow of the white, hot filaments, causing one's eyes to squint and strain to find things in the corners of the room; but we picture a room flooded with mellow illumination emitted from fixtures which shield the direct rays of light from our vision.

Another change has come about in our conception of good illumination, in the quantity and intensity of the light we expect from the incandescent bulb. It was only a few years ago that we marvelled at the yellow light given off by the sixteen candle-power, carbon filament bulb. But today, if a bulb gave off as feeble an attempt at lighting as did these old ones, we would think it on its way to the graveyard of lightning-bugs. We cannot talk of sixteen candle-power lamps when the glow of a modern Mazda light is around. We used to specify on the plans so many sixteen candle-power lights for the dining-room or living-room fixtures, and it is hard to change our habits to refer to the modern 40 or 50 watt lamps which have taken their place in the home.

Thus within a period of not more than ten years our whole conception of illumination has been jolted out of a rut.

Indirect Lighting

Now we have reacted so far in the matter of protecting our eyes from a direct view of the source of light that some enthusiasts advocate a system of indirect illumination, concealing the lights so completely from the eyes that their location is difficult to know. This is carrying the problem too far beyond its rational limits. Such a system of indirect illumination reduces shadow to a minimum, consequently the forms and the beauty of objects in the room are flattened. Moreover, the eye unconsciously is confused at not being able to locate the source from which the illumination comes, and being puzzled the mind naturally resents it. For the small house, at least, the system of indirect illumination carried to this extreme is not at all suitable.

A type of fixture which develops a partial indirect illumination, and yet which allows a certain quantity of light to come through direct to the eyes, so that the source of light is easily discernible is the most satisfying and most suggestive of home comfort. Such a fixture is shown in Figure I.

Now the problem of illumination for the small house can be sanely considered from five different angles: (1) General illumination; (2) local illumination; (3) ornamental illumination; (4) movable lamps; and (5) light control.

By general illumination is meant the lighting required to flood the room as a whole, and not locally in any one corner. The easiest and commonest method of doing this is to provide a central fixture, containing from two to four

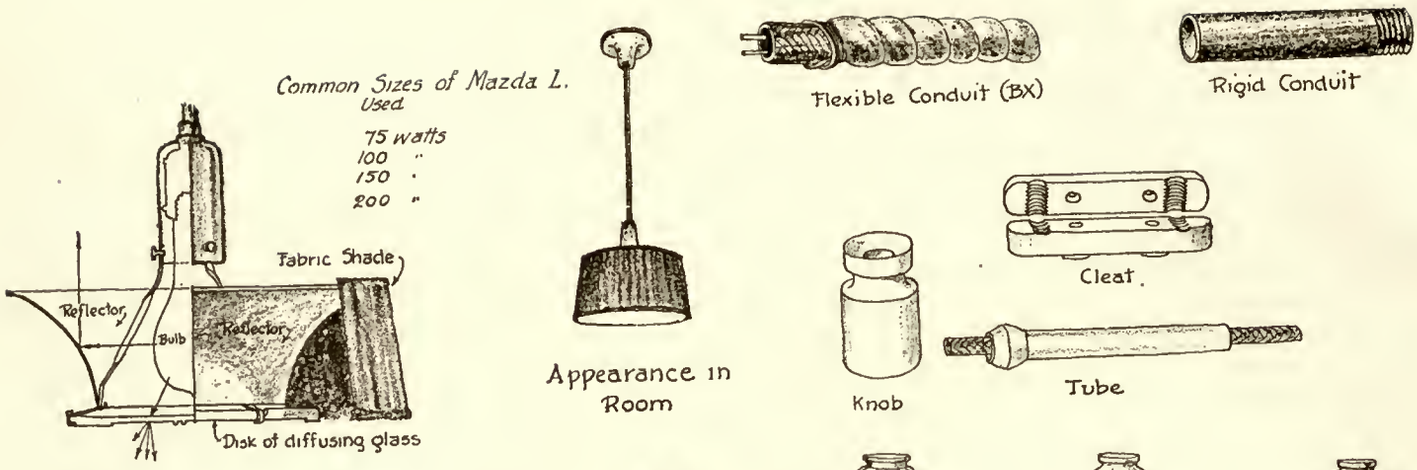
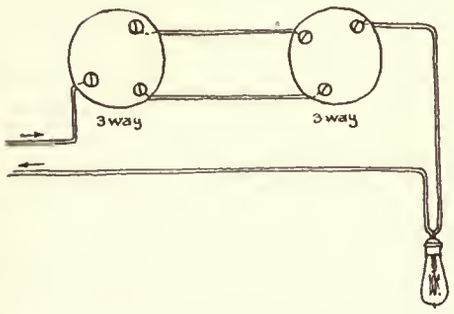
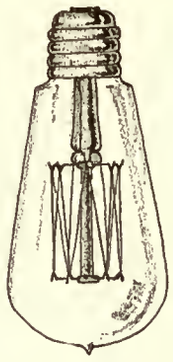


Fig 1



The 3-way Switch to control light at two places



The Modern 50 Watt Bulb

Types of Direct Lighting Reflectors

SMALL HOUSE
ELECTRIC EQUIPMENT LIST

1. General Illumination — No. indicates how many 50-watt lights or equivalent. Central light in all rooms. Dining R. & Living R. = [2]. Other rooms = [1] including Hall & Porch.
2. Local Illumination using [2] [1]. Placed above or near:– Furnace, Coal bin, Laundry tubs, Ironing board, Kitchen sink, Serving table, Lavatory, Dressers, Closets.
3. Ornamental Lights. Side lights wherever desired. [1]
4. Movable Lights. [2] Base or wall outlets for Reading Lamp in L.R.– Candles in D.R. Table lamp at bed-side in Bed Room.
5. Control. S3 → Location of Meter, Distributing panel. Control switch in each room for Gen. Lighting. Two control switches for lights in Halls, Porches Front door, cellar.
6. Mechanical Device outlets. Special power current outlets. One in Cellar, Kitchen, Pantry, Dining Room, Living Room, Bath Room, Master Bed Room. Two in Laundry. Ordinary outlets for fans, and vacuum cleaner evenly distributed through house.
7. Bells. Push button in D.R.–Front and Rear Door. Annunciator in Kitchen.

50-watt lamps, or their equivalent, which are hidden in some commercial type of semi-indirect lighting fixture. The type of fixture shown in Figure I is one of the finest, and with a silk shade around it the warm, cheerful effect of a home is greatly enhanced by this method of lighting. When this fixture is hung in the dining-room or living-room a single 200-watt Mazda lamp is employed, while in the other rooms a single 100-watt lamp is used. In the kitchen no shade is necessary. Usually in laying out the electric outlets upon a plan the central dining-room and living-room lights are shown to carry four 50-watt lamps, and those in the other rooms, in the hall, and on the porch are marked to have two 50-watt lamps or their equivalent.

But it is not absolutely essential to have a central light for general illumination. Some architects prefer to have a certain number of wall lights controlled by one switch, and obtain a general glow with these lamps. By securing the right type of fixture which shields the raw filament of light from the eyes this method of general illumination often produces a feeling of comfort and homelikeness unsurpassed by the other system.

In those rooms where work is done under the central light, such as the kitchen and pantry, and where opaque, indirect reflectors have been used throughout the rest of the house, it is essential to provide direct lighting-fixtures, so that the light can be thrown down upon the working plane. Translucent reflectors or prismatic reflectors are used, and a frosted bulb or a porcelain-tipped bulb is most suitable with this reflector.

Local illumination is intended to give greater intensity of light over certain portions of the room where work is carried on. Either a wall light or a special drop light, protected by a reflector, is used. Such lights are placed conveniently over the kitchen sink and side table, over the laundry tubs and ironing-board, over the coal-bin, near the boiler and over the work-bench in the cellar, by the side of the lavatory in the bathroom, over at the side of the dresser in the bedrooms, inside of closets and alongside of the serving-table in the dining-room. These local outlets are generally planned to carry two 50-watt lamps or their equivalent.

Other wall lights than these are usually introduced for ornamental purposes. The side lights for the fireplace in the living-room, or the panel lights on the wall, or the bracket lights for the bookcase cannot be considered more than ornamental features. Not more than one 50-watt lamp is planned for these outlets.

In addition to the general, local, and ornamental illumination are those portable lamps which have become more and more a serviceable and decorative feature of the

home. The reading-lamp in the living-room, the light for the music on the piano, the table-lamp in the bedroom, and the candle-lamps on the dining-room table are the most used of this portable type. To properly attach these bulbs, a baseboard outlet must be installed at a convenient place in the room, so that the electric cord to the light will not have to be too long nor pass across any part of the floor where it may trip up the feet of some absent-minded member of the family.

When the lighting of the small house has been considered from these angles, the control is then the essential problem. The incoming feeder, the meter, the house switch and service switch, and the distributing panel must be located conveniently in the cellar. Often the distributing panel with its fuses is placed on the first floor for convenience of replacing a burned-out fuse when some line has been overcharged.

The next matter of control is the location of switches. All central outlets and general illumination should be controlled by a switch at the entrance-door to the room. The usual type of switch used is the so-called three-way switch.

The hall light should be controlled from up-stairs and from down-stairs. The porch lights and the front and rear door lights should be switched on and off either from the inside or outside of the house. One light in the cellar should be governed by a switch at the top of the cellar stairs. And this is about all the complication of control necessary.

Now in addition to the lighting of a house, certain floor and baseboard outlets must be provided for attaching various electrical devices that have become rather common. In every cellar there should be at least one special power-current outlet for any household machinery that might be installed. In the laundry there should be at least two special outlets to which a washing-machine, a mangle, electric drier, or an electric iron can be connected.

There should be at least one special outlet in the kitchen to which may be attached a motor for operating the coffee-grinder, egg-beater, ice-cream freezer, dish-washer, etc. Sometimes an electric refrigerator may be installed, in which case an outlet must be provided for this motor.

Sometimes a special outlet is installed in the pantry for a dish-warmer or water-heater.

In the dining-room a floor outlet should be provided for operating on the table such things as a toaster, chafing-dish, coffee-percolator, egg-boiler, etc.

In the living-room a floor outlet will be found useful for such electric apparatus as would be carried on a tea-table or for running a home stereopticon.

In the bathroom and in the master's bedroom a special outlet is useful to connect up such devices as vibrators, hair-driers, curling-irons, shaving-mugs, electric heaters, etc.

Baseboard outlets of the ordinary type should be distributed throughout the house to provide convenient connections for vacuum cleaners and fans.

Common-Sense Solution Needed

Moreover, the lighting of a small house must be studied with common sense, and no rule of the thumb can be laid down. Certain enthusiastic illuminating engineers offer typical plans and suggestions for the wiring of houses, which plans are crowded so full of outlets that they look like a map of the starry heavens. If all lights were turned on at once and all base plugs attached to lamps there would be a possible grand total of twenty 50-watt lamps in this medium-sized room. Such brilliant illumination might please the jaded nerves of the tired business man, but his wife would never consent to such a garish display of wealth-eating current.

Most of these electric devices require not more than 600 watts. Electric irons, toasters, chafing-dishes, coffee-percolators, and other heating mechanisms use up to this maximum of watts, but motor-operated machines, like fans and ice-cream freezers, require about 100 watts. As the Electric Code of the National Board of Fire Underwriters stipulates that no branch circuits of a house lighting system should carry more than 660 watts, the danger of overloading these special outlets is not great, if they have been previously planned for this work. In fact, the reliance upon the standards of this code have removed from the architect all worries concerning the correct installation of the wiring system, provided he makes the proper arrangement on his plans for an adequate number of outlets.

As to the kind of wiring which the architect should specify, he has a limited choice. The knob-and-tube system is the cheapest, but not the safest. The flexible cable (BX) is better, although slightly more expensive. Rigid conduits or flexible steel conduits are not suited to the economic needs of the small house and are not used, except in special places. For example, an overhead feed wire may be brought in from the street at the level of the cornice, and then carried down to the cellar in a rigid conduit on the outside of the house.

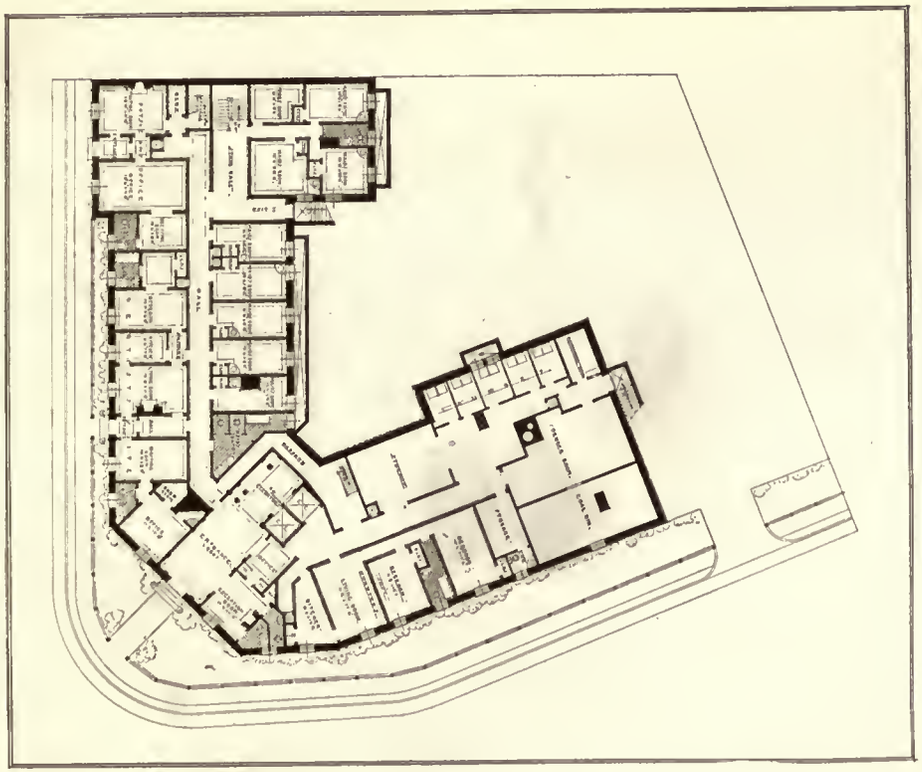
In addition to the wiring for lighting there must be an independent system for bell service. The current for such a system must be supplied by dry batteries when the local power company gives a service of direct current, but when it supplies an alternating current a transformer can be used and the bells operated upon this energy. In the kitchen there should be a magnet, operated annunciator, connected with the front and rear doors and the dining-room push button.

In laying out the lighting plans for a small house the standard symbols shown here are always used, but a key should always be given to their meaning upon some part of the sheet, for it must be appreciated that the contractor can easily forget.

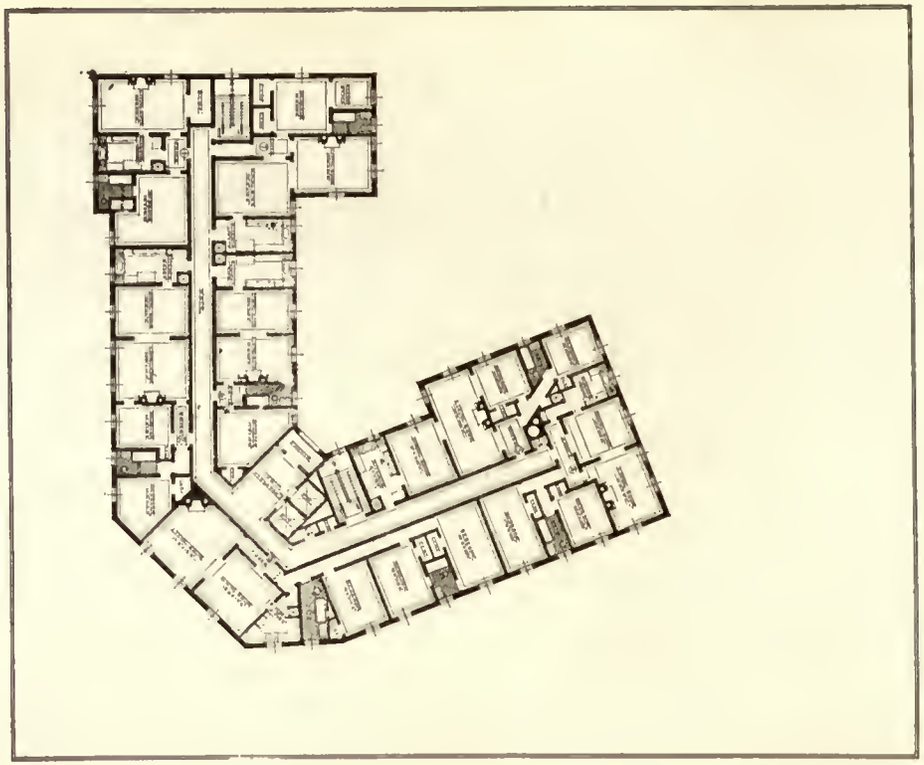
As an aid to laying out the lighting system on the plans, the following checking list is suggested, since it is simpler and more reasonable than the usual lists offered by illuminating engineers.

Unless specified to the contrary, it is usual to assume that wall outlets in the living-room are to be placed 5 feet 6 inches above the floor, in bedrooms 5 feet 4 inches, and in halls 6 feet 3 inches. The usual height at which switches are placed is 4 feet.

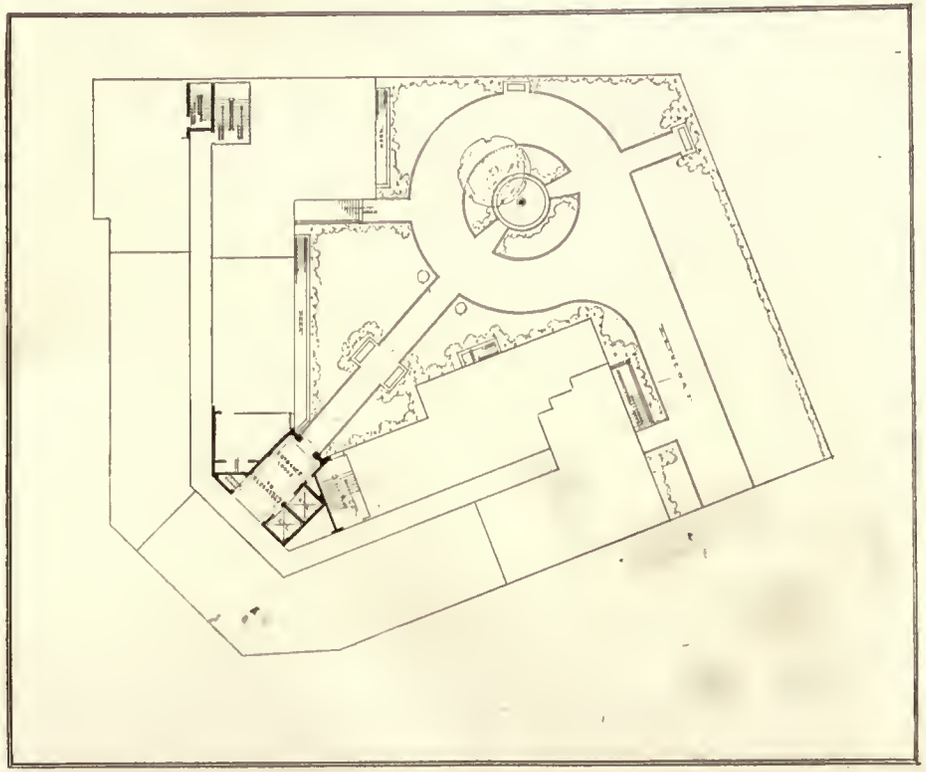
Thus, by using common sense and the phrase, "All work shall meet the requirements of the National Electric Code," and requiring the contractor to furnish a certificate of approval for the entire installation as issued by the Board of Fire Underwriters having jurisdiction in the community, the architect can secure a reasonably good and safe system of wiring and lighting.



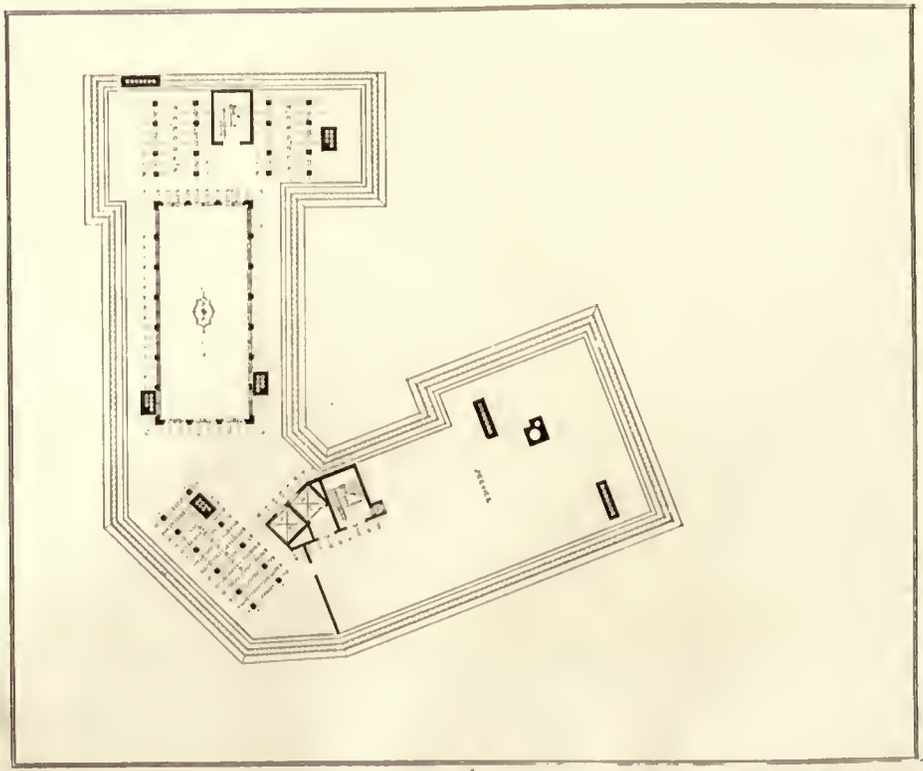
FIRST-FLOOR PLAN.



TYPICAL FLOOR PLAN.



GROUND PLAN.



ROOF PLAN.

Dwight James Baum, Architect.

PLANS, LIVINGSTON APARTMENTS, DOBBS FERRY, N. Y.

FRONT.

GARDEN SIDE.

LIVINGSTON APARTMENTS, DOBBS FERRY, N. Y.

Dwight James Baum, Architect.

"Birchwood"—An Adirondack Camp

By Dennison and Hirons

The boat-house.

THERE is no more fascinating object in architecture than the conceiving and executing of a human habitation, under liberal and unusual conditions amid surroundings of the greatest beauty. It calls for the sympathetic appreciation and understanding of a large number of complex factors—of the owner's desires, his personality, the character of the country, and the details of the immediate surroundings, the directions of views, windows, sunlight, and approach.

And in the case of a woods camp there are additional and most interesting considerations involved, for there one goes for relief from the more conventional environment, and there is a definite requirement to subdue as much as possible any reminder of overcivilization which might tend to weaken the contrast.

Comparatively few persons are inclined to court the stern rigors of actual camping conditions, and, indeed, there is no necessity to go to such extreme in order to obtain ample contrast with town or the usual country life. One can easily gain the greatest benefits of the contrast without the disagreeable drawbacks that accompany a complete sacrifice of accustomed comforts and conveniences. This ideal combination of a maximum of country enjoyment with a minimum of discomfort is marvellously well made in such a group as "Birchwood," a camp on Lake Placid.

The prime requirements in such a group are to make them appear to grow out of the landscape, of harmonizing them with nature's structures.

At the foot of Old Whiteface the dainty birches and the rugged cedars march down among the strong gray rocks to this bewitching mirror of the sky, which reflects their massed ranks in a shimmering tangle of sunlight and cloud.

The cedars, if cut at the proper season, retain their bark better than do the other native trees, so they were used for the exposed framework, resting upon native rock masonry. The walls themselves were covered with large, rough, old-fashioned shingles, relieved and enriched by interesting log rafters, brackets, and railings. Thus were achieved texture and color consonant with the environment. A note of emphasis was obtained by coloring the woodwork of the windows a cream white.

Dining-room.

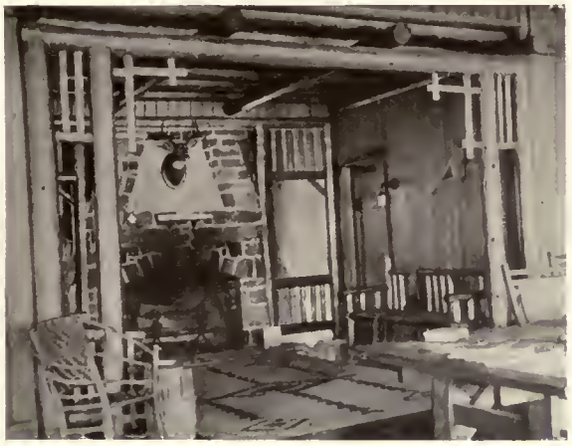
In this region of delightful summers and rigorous winters, comfort and health make strict demands for their preservation. On account of the great snow-storms, accessibility of all parts of the camp required that it be assembled as far as possible under one roof. To obtain the full advantage of the breezes of summer and for protection against the wild life of the woods, the bedrooms were placed in the second story.

In the milder seasons the broad terrace and wide porches permit of comfort while enjoying the changing beauties of the view. The terrace walls and the rock ledge from which they grew are partly hidden by a velvety mass of verdure and framed in a tumble of wild grape and honeysuckle.

From the terrace one enters a generous hall with dining and living rooms opening on either side. The walls are ceiled with soft-toned spruce boards, both for the refreshing

Hall.

Living-room.



Fireplace in living-room.

The winter camp.

effect and to obviate the possible danger to plaster put up on native timber construction. The ceiling was carefully plastered in small panels formed by exposed natural beams and finished in a velvet sand surface. Slender logs of silver birch frame the windows and make a rustic balustrade to the second floor.

Within, an effect of simplicity and naturalness predominates. Airy and cool in summer, by reason of the large windows, the rooms are made snug in winter by the log-burning stone fireplaces surmounted by moose heads and other trophies of the huntsman.

Even the lighting fixtures are fashioned in harmony with the environment, and curious andirons and other useful equipment engage the eye.

Unobtrusively planted by the brook near the house a tiny power-plant furnishes the necessary electric current, while the entire group is protected and maintained by the keeper, who dwells in an attractive lodge near by.

The house from the lake.

Descending a flight of fern-bordered rock steps from the terrace, one reaches the boat-house, built in harmony with the camp-house, and composing successfully with it. Balcony and broad living-room afford an advantageous outlook directly over the lake. Below the boat-house living-room is the water of the lake itself, forming the capacious boat shelter, and extending out from shore is seen the boat-landing, incomparably more attractive than the ordinary "dock." The disposition of materials here is extraordinarily beautiful; the railings show good taste in design.

Fitness and comfort are happily blended in this wood camp.

The Cleveland Architectural Advisory Bureau

Established by the City Plan Committee of the Cleveland Chamber of Commerce

Establishment of the Bureau.—The purpose of the Cleveland Architectural Advisory Bureau is to stimulate building and to better the type, quality, appearance, and plan of the buildings erected in Cleveland.

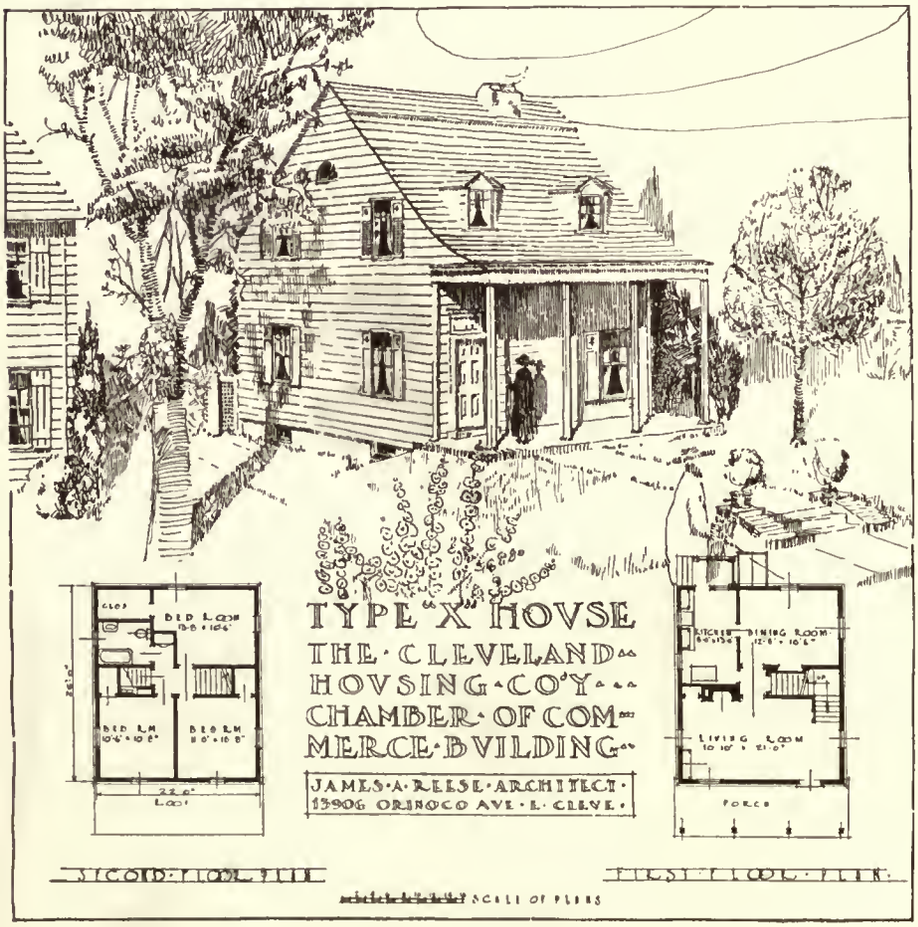
In 1919, 12,283 building permits were issued in Cleveland. Of these, 533, less than 5 per cent, were estimated when permits were applied for, as of over $10,000 valuation. It is safe to say, then, that over 90 per cent of the buildings erected in Cleveland in 1919 were constructed without the employment of men especially trained in the designing of buildings. This percentage holds, almost exactly, for 1918.

There are not less than five different sets of people interested in every new building constructed within the city of Cleveland: (1) Those who will live in the building; (2) those who will live in the neighborhood of the building; (3) those who invest their money in the building; (4) those who have invested their money in the neighboring buildings or real estate; (5) the general body of citizens who see the building and are affected by it day by day.

All of these interests are intrusted to the foresight and public spirit of the original planner of the building. His primary object is, very often, to safeguard his own immediate financial interests, and too often this is accomplished at the sacrifice of all the other interests concerned.

It will be the immediate purpose of this bureau to secure the services of competent technical advisers to the owner or borrower on building operations in the knowledge that through their assistance the small fee necessarily charged would be returned many times over in economy of cost, as well as improvement of plan.

There are two obvious means of control of appearance and plan of building which can be invoked. First, since the type of building erected in Cleveland is of importance to Cleveland's citizens, it can be controlled by public opinion. Though this is the most powerful control ultimately, it is slow to act. The second means of control is the erection loan. As improved architecture and plan of building increases its value and its salability, it is believed that the building and loan and savings and loan companies who furnish capital for home construction will co-operate with this architectural advisory bureau by depending upon the bureau's certificate in passing upon the loan. This would establish a practical and immediately effective means of control.

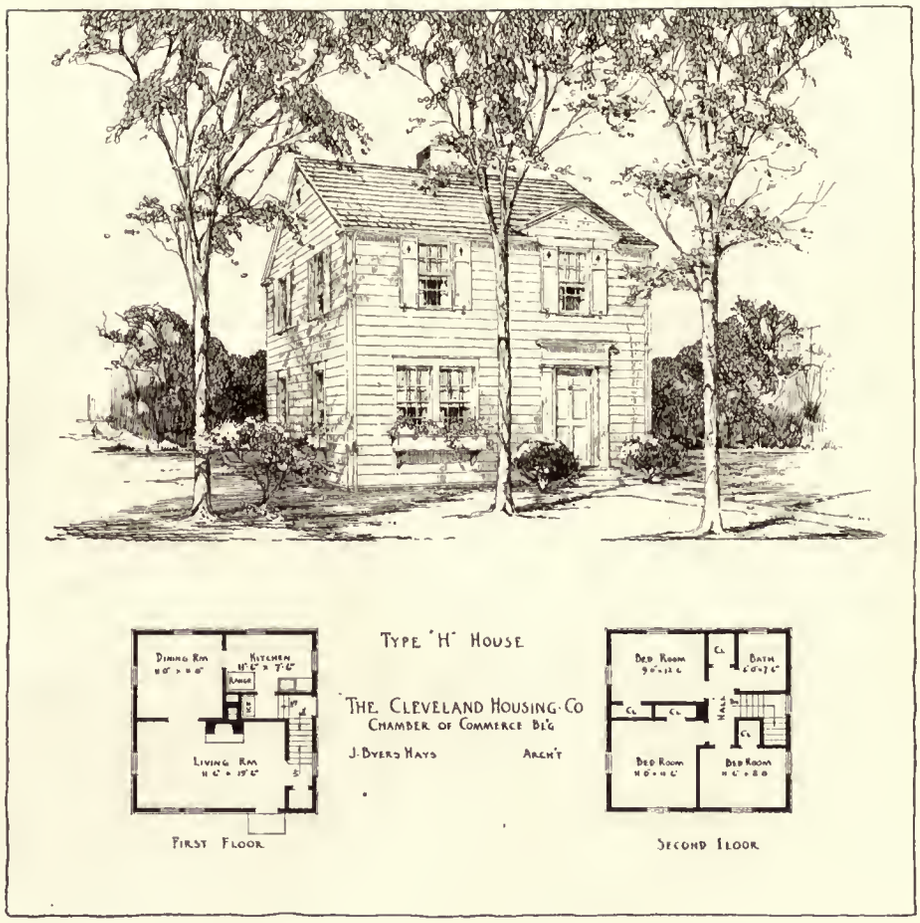


The erection loans in Cleveland are made, as a rule, by the twenty old and established savings and loan companies in the city, the twenty or more new ones which have been established in the last seven years, the second-mortgage loan companies, a few of the banks, savings and trust companies, and four or five of the life-insurance companies which have independent lending offices in Cleveland. Thus, funds deposited by all of the citizens of Cleveland are utilized in financing building operations far less useful than they might be to those citizens, and in some cases actually detrimental to the property values and the welfare of the city.

The building material companies often find themselves financially involved in a building for which they have furnished material through a lien which makes them third mortgage holders, but as to the architecture, plan, or construction of the building, and, consequently, as to its salability, they have no guaranty.

To meet this situation the Cleveland Architectural Advisory Bureau will be established by the Cleveland Chamber of Commerce, as authorized by the board of directors under date of November 5, 1919.

A subcommittee of the city plan committee will be in charge. This subcommittee is appointed by the president of the Chamber of Commerce: Abram Garfield, chairman, architect; Arch C. Klumph, vice-chairman, president the Cuyahoga Lumber Co.; F. H. Chapin, the Upson Nut Co.; Raymond T. Cragin, real estate; W. J. Crawford, Jr., real estate; M. H. Horvath, landscape architect; Herman Schmitt, the Cleveland Builders' Supply Co.; George N. Sherwin, secretary First Trust and Savings Co.; George S. Summerell, Commissioner of Building, city of Cleveland.



In order to give the various organizations and persons interested in better building in Cleveland knowledge of its plans and activities, and to co-operate in the work, the committee in charge has appointed a number of prominent men and women to become members of its advisory board. This board will meet upon call of the subcommittee.

The executive staff of the bureau will be composed of architects, engineers, builders, and other technical experts who will carry out the technical work of the bureau within its financial limits.

Field of Operation of the Bureau.—1. The bureau will give advice to those so desiring, relative to the problems of acquiring and building a home. (This will include advice as to location in harmony with place of employment, etc., problems of finance, how to secure plans, let contracts, etc.)

2. It will analyze such plans as are submitted and indorse them as they are, make recommendations for their betterment, or reject them in their entirety. This inspection will have regard to:

(*a*) The architectural design of the exterior; the arrangement of the interior, and matters of sanitation, ventilation, etc. The bureau will work in close co-operation with the Building and Health Departments of the city in this regard.

(*b*) Suitability of building, both in appearance and value, to its surroundings.

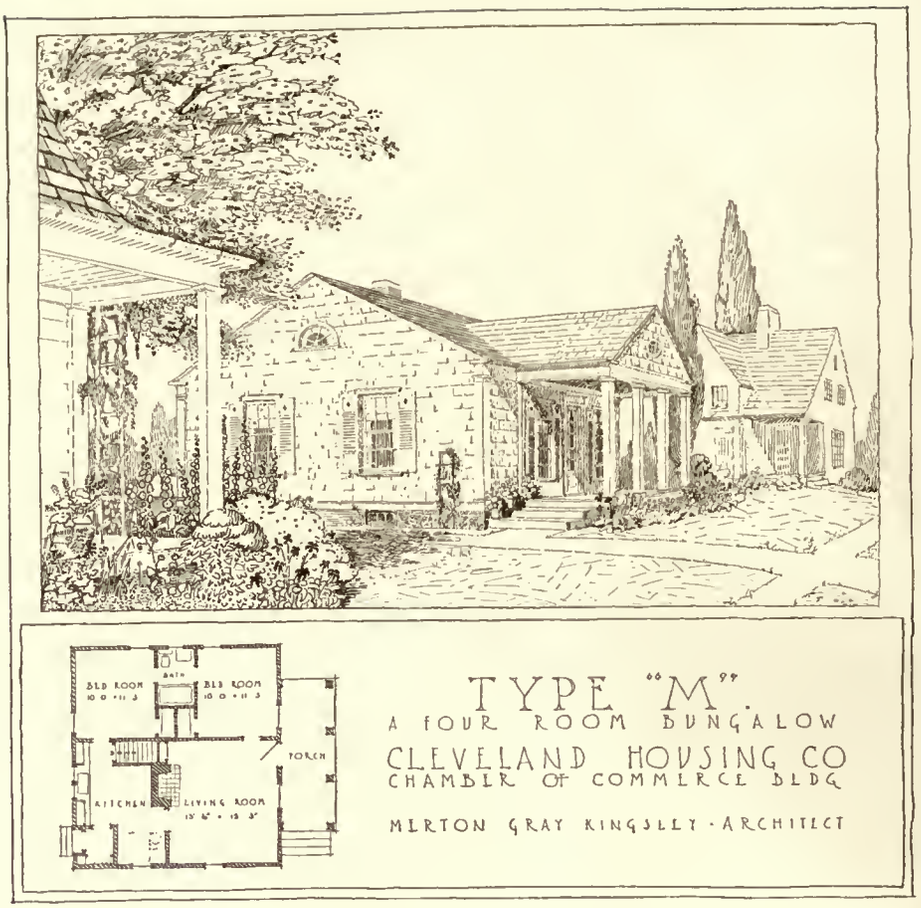
3. It will issue a certificate based upon the value of the plans so submitted, having regard both to the architectural appearance of the house and the proper arrangement of rooms. This certificate will be of value to the builder in financing the project.

4. The bureau will eventually be possessed of a large number of plans of ideal homes of all classes and in all values from perhaps $1,000 to $20,000 in cost. These will be shown to the prospective builder, but it will not be the purpose of the bureau to furnish plans in competition with architects. The bureau will merely direct the prospective builder to the proper place for his plans.

5. When so desired, either by the owner or by the mortgagor, the bureau will make careful inspection during the construction of the building, and upon its completion issue a final certificate which will testify as to the manner in which the house is constructed, giving it a rating which should influence its selling value.

6. The bureau will co-operate with home-owners in improving property already built, and it may institute surveys for the purpose of recommending changes in certain structures or certain sections for the improvement of appearances.

7. The bureau may make surveys of different sections of the city and recommend and endeavor to stimulate building where needed for the problems of the immediate community.



Financial Plan of the Bureau.—A fee will be charged the owner or builder for inspection of plans and a fee for inspection of buildings while in process of construction. Other fees may be instituted from time to time for different services rendered. The fee will be on a percentage basis, depending on the size and amount of the building operations. The rate of this fee has not been decided upon. It is expected that in less than three years the bureau will be self-sustaining.

Budget.—Executive officer, architect, or engineer, $6,000; inspector, $4,000; office supplies and expenses, $2,400; rent, $1,200; miscellaneous, $1,400; total, $15,000.

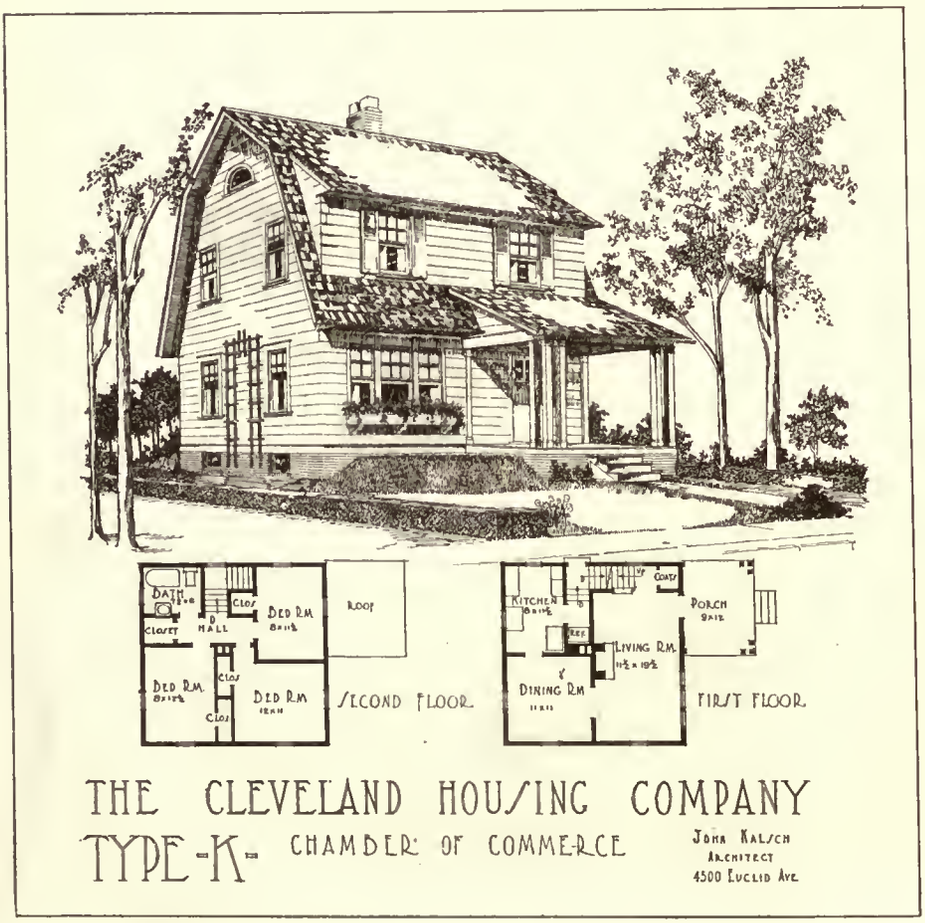
During the first three years a guaranty fund of $15,000 per year will be subscribed by organizations interested financially in building and who will receive direct financial benefit from the erection of good buildings instead of mediocre or poor ones. Such organizations are: National banks, trust companies, savings and loan companies, building and loan companies, second-mortgage companies, building-supply companies, insurance companies, realty companies, brokerage companies.

The amount to be subscribed by each will be in proportion to the benefit each will obtain.

The Cleveland Chamber of Commerce offers operating space, rent free, for the first year.

Executive Staff.—The executive staff will consist, on organization of the bureau, of an architect, who will be the executive head of the organization, an engineer-inspector, and such office help as is necessary.

The office of the bureau will be in the Cleveland Chamber of Commerce.



Book Reviews

ENGLISH HOMES. Period I, Vol. I. Norman and Plantagenet, 1066–1485. By L. Avray Tipping, M.A., F.S.A. Over 400 illustrations and Plans. Charles Scribner's Sons, New York.

This is the second volume published, but the first in chronological order, in the notable series that promises to be a definitive history of English domestic architecture and home life. It is an undertaking that involves an immense amount of research, and will afford a wonderful reference library both for the student of architecture and the seeker after details of personal history associated with the progress of English home-building. A former volume, "Late Stuart," was reviewed in this magazine. The series as now planned includes: Norman and Plantagenet, 1066–1485; Early Tudor, 1485–1558; Late Tudor and Early Stuart, Early Georgian, Late Georgian, with a promise of other volumes to follow.

Caldecott Castle, Monmouthshire. The Windstock Tower through the lancet window of the keep.

In dealing with England's great historic homes the author gives, so far as possible, the architectural beginnings, and tells the story of the families associated through the years with their decay or restoration.

Few periods offer a more romantic background than that discussed in the volume named above: "From Senlac to Bosworth, the picture of the great castles of the barons, knights and squires under Norman and Plantagenet kings."

The great keeps of famous castles still standing, the barbicans, the immense walls built to defy attack and afford an impregnable defense, tell more than words can the military character of domestic building, the prevailing lawlessness, the power of the sword, the pride and aggression of conquerors and conquered. One cannot read the text or look at the illustrations without realizing the background in which knights in armor fought and great lords held jousts in the courtyard. We can see again as in Scott famous knights riding to battle or competing in the tourney, hear the clatter of hoofs on the drawbridge and the clang of the portcullis as it fell to close the way against armed attack.

We may follow the purely defensive homes to the later structures when the country was more settled and domestic comfort was more considered.

In all of the earlier homes the great hall was the principal architectural feature, and the superb timbered roofs and great fireplaces are a neverfailing source of interest and inspiration.

Beginning with the keeps of Rochester and Hedingham, built in the earlier half of the twelfth century, the story includes the superposed walls of the Prince-Bishop of Durham, and the gabled roof and side aisles set within castle walls by de Ferrers at Oakham.

In the fifteenth century are contrasted the reversion to the Norman idea shown by Lord Cromwell's tower at Tattersall, and the growing feeling for light, comfort, and convenience displayed by the open manor-house of Chatfield. We can see "the changes in planning and designing and the differences arising from their builders' purpose, purse and personality."

The materials depending upon location were chiefly brick and stone, with the profuse use of timber for which English craftsmen have been always famous.

The illustrations are beautifully reproduced, and include a great mass of details full of suggestive value. The volume presents a very full review of the planning, designing, and decorating of the mediæval house. "At Bamburgh there is the rare example of a Norman keep still used for habitation. Yet—outstanding feature though it be—it forms only a fraction of the entire fabric and illustrates but a page in lengthy annals. To no spot on our shores does more history, legendary and real, cling than to the storm-beaten Whinstone rock of the Northumbrian coast that springs up from the mainland marsh and looks across the sea to the island brethren of Farne. For did not men of old say that Bamburgh and the Castle Joyous Gard are one and the same? It looms large, therefore, in the history of King Arthur and his knights, for we read in Sir Thomas Mallory's pages that "Sir Launcelot brought Sir Tristram and La Beale Isoud unto Joyous Gard, that was his own castle that he had won with his own hands. . . . And wit ye well that Castle was garnished and furnished for a king and a queen royal there to have sojourned." For long it was the headquarters of this gallant knight and his fair queen companion, and hence he sallied forth to do the many deeds of valour that for a time overshadowed even Sir Launcelot's fame; but "ever, between, Sir Tristram resorted unto Joyous Gard whereat La Beale Isoud was, that loved him as her life." Here, too, it was, later on, that Sir Launcelot brought Queen Guinevere, saving her from King Arthur's wrath and death by fire; and hither the King pursued them and besieged them, and many a knight lost his life ere the Pope intervened and bade Arthur take back his Queen. Dolorous Gard it then became to Launcelot, who sailed away to foreign lands. But when the final tragedy occurred, when the dead Queen had been laid by the side of the dead King, and Sir Launcelot would live no longer, it was to Joyous Gard they brought him. "And there they laid his corpse in the body of the quire, and sang and read many psalters and prayers over him and about him."

When from romance we pass to reality we find that in the realm of fact the rock holds equally high place. Bamburgh gives way to no castle in the land in the matter of enduring occupation. From its long, narrow plateau, with pointed ends and precipitous sides falling into sea or marshland, King Ida ruled the first Anglian kingdom of Northern Britain in the sixth century. The twentieth century still finds it the home of man, much recent building, of a more or less restorative character, having fitted it for modern inhabitance. A period of nigh one thousand three hundred and eighty known years has seen it entirely deserted for only a comparatively short time, and its rugged walls have often witnessed stirring events. They have held at bay many an enemy and have seldom given way to straightforward assault and battery.

This volume forms, it might be said, the undercroft on which the upper stories of English architectural development are reared. In it are laid the bases of the evolutionary history of house-planning, designing, and decorating in the land throughout all succeeding phases of both Gothic and Renaissance styles. But while the main purpose is architectural, here as throughout the series, the human element is kept well to the fore by narration of the home and public life of the owners of the various castles and manor-houses that are carefully described and profusely illustrated.

Sir William Armstrong says that the early Norman house was a lineal descendant of the Roman villa, the open atrium became the hall by force of weather and this was the only large room in the building used in common by the master and his retainers. Subordinate chambers were added later but the conception of a house with a hall with a few chambers was the type. The halls, as shown by many examples in this book, were often of noble proportions. It took years for the house, however, to develop into a home of comparative comfort, affording the amenities of civilization.

Bamburgh Castle, Northumberland. The watch-tower and the keep.

Announcements

In the comment on the house of E. G. Cornell in the June number, Mott B. Schmidt, architect, we omitted to state that the furnishings and other decorations were all designed and supplied by the Hampton Shops.

Louis Orr's etching of the Springfield Group has been received and has won the highest commendation. It was a fine subject for an artist of Mr. Orr's attainments, and he has taken full advantage of his opportunities. We hope that more of our cities will follow Springfield's lead in this method of making its distinguished architecture more widely known.

The prize of one hundred dollars offered by the Municipal Arts Society of New York for the best project of city planning submitted by any architectural student in an American college or university was awarded to Harry T. Aspinwall, of Pittsburgh, a senior in the School of Architecture of the Carnegie Institute of Technology. Harvard, Yale, Columbia, the University of Pennsylvania, the University of St. Louis, the Georgia Institute of Technology, and Cornell were also represented in the competition.

The projects submitted were judged by a body of representative architects, and the award was made through the Beaux Arts Institute of Design of New York. The winning project was a practical plan for the beautification of the plaza of the Queensborough Bridge in New York.

Houses of Steel.—The International Housing Corporation send us announcements of their new bungalows made of steel. They can be put up complete, within thirty miles of New York's City Hall for $1,985. The houses are sold complete, ready "to start housekeeping." They may be seen on the roof of the company's office building at 42 West 33d Street. "It has not been our purpose to build a so-called portable house." This edifice is of a permanent nature. Through patented arrangements, rooms can be enlarged or additions can be made easily whenever desired, at but trifling expense.

We have received the announcement for 1920–21 of the School of Fine Arts, University of Pennsylvania, giving their courses in architecture and other arts. The school is one of the finest in the country, and has many distinguished graduates.

Alterations to the Brownley Building, 13th and F Streets, Washington, D. C., included the removal of the main entrance to the building from 13th Street to F Street. Entrance to the offices and the proper mail address of Marsh & Peter, architects, is now No. 1304 F Street N. W., Washington, D. C., instead of No. 522 13th Street.

E. Bickham Christian and Henry E. Schwarz announce their association for the practice of architecture under the firm name of Christian & Schwarz, Offices 805–806 Ardis Building, Shreveport, La.

The T-Square Club of Philadelphia is a live organization, and the executive committee reports the organization in fine condition, both as to membership and finances.

The new offices of the Atlantic Terra Cotta Company are in the Borden Building, 350 Madison Avenue, New York. Telephone, Vanderbilt 9980.

Charles B. Meyers, formerly at 1 Union Square West, has removed to new offices at 31 Union Square West, New York City.

We are glad to acknowledge the receipt of four attractive illustrated pamphlets from the American Face Brick Association. They include a series of elevations and floor plans of "Face Brick Bungalows and Small House Plans," 3 and 4, 5 and 6, and 7 and 8-room plans. They include many types of design, and, of course, various prices.

Complete plans and specifications will be furnished at a nominal cost.

Charles F. Allen announces his removal to new offices at 206 Touraine Building, Fort Worth, Texas, and will be pleased to receive catalogues and samples.

John Noyes, member of the American Society of Landscape Architects and Landscape Designer to the Missouri Botanical Garden, announces that he has opened an office for the general practice of landscape architecture and engineering at 119 North Seventh Street, St. Louis, Mo. Catalogues requested.

William Albert Swasey announces the removal of his offices to the Gotham Bank Building, Columbus Circle, New York.

Theodore L. Perrier, 208 Metaire Court Building, New Orleans, will be glad to receive catalogues and samples for building materials.

J. C. Halstead, architect, 324–325 Chamber of Commerce Building, Birmingham, Ala., will be pleased to receive catalogues.

After May 1st the Brandt-Clepper Company will be located in the Century Building, 7th Street between Penn Avenue and Duquesne Way, Pittsburgh. L. Brandt, housing engineer; H. C. Clepper, architect.

Bowdoin & Webster, architects, formerly at 299 Madison Avenue, announce their removal to 70 East 45th Street at Park Avenue, Grand Central Terminal Building.

Chester E. Wolfley wishes to announce his withdrawal from the firm of Wolfley & Eliel, architects-engineers. He will continue the practice of architecture under the name of Chester E. Wolfley, architect, with temporary offices at 610 Stewart Building, Rockford, Ill. Manufacturers' samples and catalogues are desired.

G. F. Ashley, architect, formerly with Messrs. Palmer & Hornbostel, 63 William Street, New York City, announces that he has opened offices in the First National Bank Building, Oakland, Cal., after practising in Shanghai, China, since 1915.

For the convenience of architects, engineers, and contractors in Philadelphia we have opened a local office in the Land Title Building, Room No. 1225, Chestnut and Broad Streets, where your inquiries and needs will receive prompt attention. Anti-Hydro Waterproofing Company, Newark, N. J.

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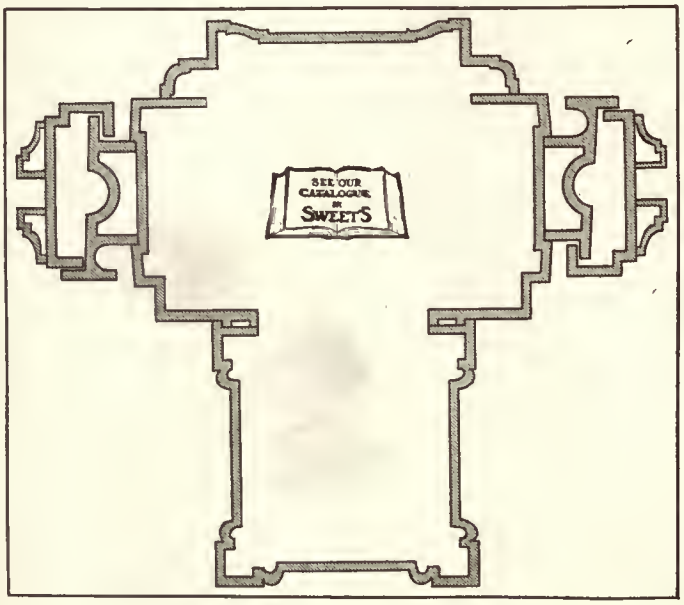

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FRONT ELEVATION, LIBERTY MEMORIAL, KANSAS CITY, MO. (WINNING DESIGN). H. Van Buren Magonigle, Architect.

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VOL. XLIV AVGVST, 1921 NO. 2

Delphi and the Oracle

By William Macy Stanton
Assistant Professor of Architecture, University of Illinois

View of base shown in Detail "A." See Plate CXXI.

THE stars shone bright through the clear Mediterranean air as we sat in the little open square of Patras, the western gate of the Peloponnesus, one summer night in 1914. We had tickets for the night-boat across the Gulf of Corinth and were making use of nature's well-appointed waiting-room while the lateness of our boat's arrival increased; late because some shepherd's flock had bolted when it came to the gang-plank at a previous port or an influential Greek had delayed the boat while he turned one more business deal and had one more glass of their resin-tasting wine. Time was of no consequence to the captain of this many-burdened ship, who waited with equal patience for the frightened sheep or the political leader of his modern country.

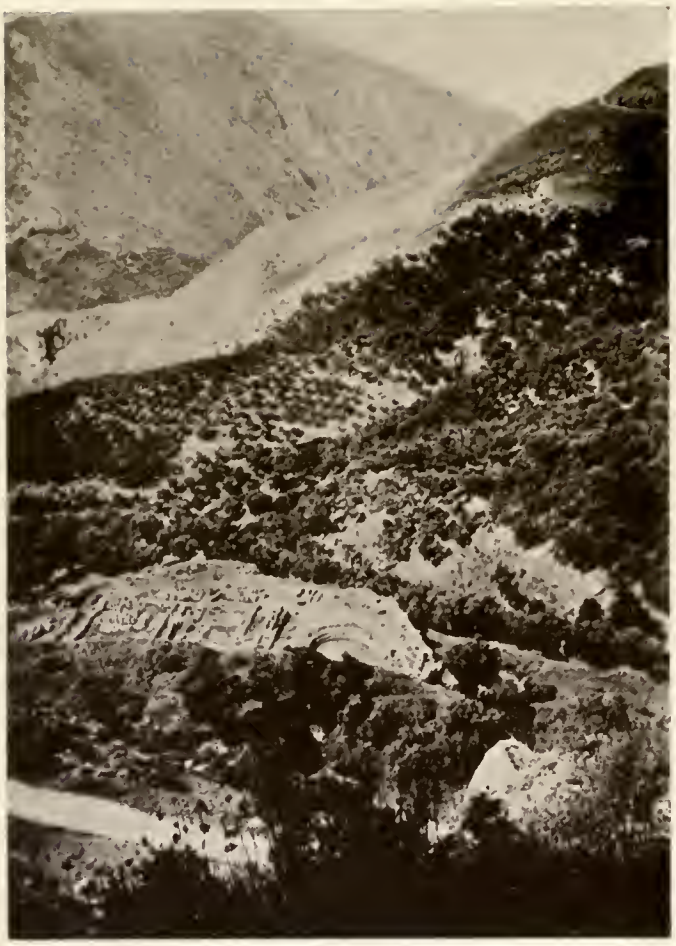
The crowd in the square became smaller as the hour grew later until only a few remained to hear the village trolley-car bump its periodical way from one edge of town to the other or to listen to the water's endless splashing on the single wharf. In this midnight quietude one longed to turn back the wheels of time and to live again in those days when Greece was the centre of the world, and to feel that the little band of fellow passengers were men of the golden days. Why not? There at the table next sat Phidias who had left Bassæ and was returning to Athens. He had come overland by the way of Olympia and now waited for a good wind to sail across to Cirrha on his way home. Here Praxiteles might have stopped to refresh himself on his way, from his final work on the Hermes in the Temple of Hera, to consult the Pythian oracle or to take up a new commission in the embellishment of the shrine at Delphi. Perhaps neither Phidias nor Praxiteles but one of those unknown artists of Hellenic civilization whose cunning hand wrought for us some fragment of that pure art that inspires with its very beauty.

The whistle of a steamship met our ears, not the flapping of sails nor the splash of oars, and we realized that the Greeks gathered around us had lost all the refinement, culture, and skill that enveloped their forefathers, and that we stood in the midst of petty merchants, shepherds, and money-changers who, symbolic of the present race, with a serene and sterling inheritance, showed nothing to-day but the solidified art of their ancestors that has stood two thousand years and now speaks to the world of the moderns' failure.

After a dangerous and uncertain trip in a rowboat from the shore to the steamship in the outer harbor we discovered our first-class accommodations consisted of a hard wooden bench in the stern of the boat, while freight and the sleek, well-fattened sheep occupied the midship sections.

Restoration of the Sacred Precinct from "Monuments Antique." By H. D'Espouy.

In the early morning hours we found ourselves at Itea, the modern seaport for Delphi. The little town is almost lost in large olive-orchards that cluster around the foot-hills of the Phedriades. A modern macadam road leads from Itea to Archova and provides the only access to the mountains and Delphi. During the ride up the winding mountain road many small hamlets and farmhouses are passed with their respective quota of ferocious, wolf-like dogs that make foot travel in Greece both uncomfortable and dangerous. After seven miles of steady climbing we reached modern Delphi with its two or three hotels and few scattering houses, all of which were built by the



The lower group of temples.

View from the theatres.

French expedition in 1893 when they moved the town from the site of the sacred precinct to allow the excavations to be carried on unimpeded.

There is nothing about this sleepy little village that gives the impression that we are standing less than half a mile from the site of the most sacred shrine of Greek antiquity. Rather we are struck with the stupidity of the people and the complete abandonment of the whole place. Children, chickens, and goats intermingle as members of one family; men bask in the sun or sit in the shade of a tree smoking the great water-cooled pipe of their own contrivance, and nowhere is there a sign of industry or ambition.

The early history of ancient Delphi is shrouded in the mysterious uncertainty of numerous legends, and it is not until the beginning of the sixth century B. C. that we are able to trace its history with any degree of accuracy. The generally accepted legend tells us that in this fold of the Phedriades there was a fissure, or cave, in the rock from which issued a gas, a breath of which caused a person to give forth inspiring exaltations, but that Earth had placed a fierce dragon there to protect the cave and allow only the oracle, personified first by a preistess from Crete, to experience the magic inspiration. Through her the world was to be told of the future. In the course of time Apollo, the god of the Ideal Arts, fought and slew the dragon and to purify himself ran to the valley of Tempe and returned crowned with a wreath of the sacred laurel. From that time on it was Apollo who was the protecting deity of the sacred precinct. A legend further says that Celæno had a son by Apollo and called his name Delphus, hence the name Delphi. But Delphus had a son, Pythes, who became king and called the town Pytho. These two names, Delphi and Pytho, are used throughout antiquity for this home of the oracle. In the Iliad and Odyssey the only mention is to the "Rocky Pytho."

Whatever the origin of the place or name, the fact remains that if we walk a little way from the modern village the road leads us around a projecting crag of the mountain and there opens up before us the ruins of ancient Delphi. No artist can paint the picture and no poet sing the praise of the real beauty of this time-honored vista in the snow-capped mountains of northern Greece. When the afternoon sun throws the shadows of the taller peaks across the precinct and lightens up the purple of the bare-sloped mountains across the valley, a picture is wrought that is soul-inspiring and reminds us again of the unequalled grandeur of the sites of the ancient Greek cities.

This is our first impression on reaching Delphi. But the impression will be deepened and enriched when the ruins are studied in detail, and a history of the shrine, as it grew and flourished, produces an atmosphere around the present reminder of its glorious past. So let us pause a moment and recall the development of the home of the Pythian oracle.

Pausanias, who travelled through Greece in the second century A. D., pictures the first temple of Apollo in wood, built of olive-branches carried from the valley of Tempe. This first crude hut was replaced by one built of wax and wings of bees, which was replaced by a temple of brass. Whether these legends are true or not is of very little importance, but we do know that a stone temple preceded the one now in ruins.

In 373 B. C. an earthquake destroyed the temple and laid low many of the other buildings and statues, but the Greek world at that time was firmly held together by the common faith. The power and sacredness of the Delphic

Ruins of the Tholos, shown in Detail "B." See Plate CXXI

oracle was so wide-spread that contributions were sent in from the mother country and all the colonies on the border of the Mediterranean until a great fortune was available to rebuild the temple. Spentharus, a Corinthian, was employed as the architect and there was erected one of the finest Doric temples of antiquity, built of white marble over the foundations of the earlier structure. This temple, dedicated to Apollo, was the largest but by no means the only edifice in the sacred precinct. Individuals, cities, and states consulted the oracle previous to all of their important undertakings. They followed with a religious exactness every detail of its command and when fortune favored them in their various pursuits they felt duty-bound to send to Delphi an offering to Apollo. For example, when Athens won the victory at Marathon, the Athenians built a treasury at Delphi, because they felt that Apollo had delivered them from their enemies, and after the battle of Plataæ the Greeks in common made a votive offering of a gold dragon standing on a bronze tripod. In some cases states or cities were told by the oracle that they must either pay a certain part of all the plunder, from their enemies, to Apollo and turn over a tenth part of their earnings or else the protecting hand of Apollo would be withdrawn. So the treasury of the Sicyonians was built, and into this treasury was placed, each year, one-tenth of the gold-mine on the island of Siphnos. We are told that these people grew tired and left off the tribute, and that the sea encroached and swept away their mines. It was this almost pagan fear of the wrath of the gods that held the people and the states to their vows. As a result there accumulated at Delphi a wealth of gold and beautiful works of art unparalleled in history, for all the Greek world sent to its favorite deity the riches of the land.

During the festivals which occurred at Delphi, at regular intervals for many years, athletic contests similar to the Olympian games were held. It was a custom for the winning athletes to erect in their own memory a statue as an offering to Apollo and for the victorious participant in the musical contests to leave his prize to adorn the house of the god. With all the offerings from so many sources, it is not difficult to picture this great natural outdoor museum filled to overflowing with monuments, statues, and small edifices, making the whole enclosure a brilliant mass of form and color.

The precinct of Delphi had belonged to all of the states and had been considered a common sanctuary, but jealousy arose and we find the states fighting a long, sacred war for the possession of the precinct, looting the treasury of gold in order to carry on the war. All were willing, however, to unite against a common enemy—the Celts. Apollo showed again a protecting hand. We are told by Pausanias that an earthquake shook stones loose on the mountains, causing avalanches that killed many of the enemy. There was such thunder that the orders of the officers could not be heard. That night after the Greeks had driven the enemy back, a great snow fell and many thousands of the Celts perished. The history from this time on records almost continuous sacking and pillaging of the temple, but it remained for the Romans to do the most devastating part, and the desecration of the shrine was culminated when Nero carried away five hundred bronze statues. What destruction man was not able to accomplish landslides and earthquakes did, leaving the marble buildings in ruins. Through the Middle Ages these ruins were used as stone quarries and lime-kilns, and the final débris was completely covered by landslides and the entire site was buried. Upon this fill there grew up a miserable village of dilapidated one-story huts. These are the conditions that French expedition from the school in Athens found when they started to excavate in 1893.

As we stroll to-day through the ruins we see only a vestige of Delphi's ancient glory, only a ground plan of the citadel that was so dear to the art-loving Greek. Only one building stands to-day and that is the "Treasure House of the Athenians." There is remaining, however, enough to thrill the visitor and draw him to seek, if but from some small detail, the Greek refinements and the exactness of the workmanship. Up a steep incline, by curves and flights of steps, flanked on either side by walls and bases of statues, the way leads past the foundations of treasuries to the open

Rubbing direct from base of Tholos, showing methods used by Greek workmen in locating columns. The lines were scratched in the marble. (Rubbing half actual size.)

space in front of the temple of Apollo. Not a stone of this noble edifice stands, but strewn all about are fragments of column drums, capitals, and the Doric cornice, almost lost in weeds and overrun with lizards. Above the temple on the upper terrace other fragments tell of the beauty of the single statues or the offerings in large groups.

The theatre is reached by a long flight of marble steps flanked on either side by honeycombed walls. The seats are well preserved and the whole contour of the theatre is easily traceable. This location is one of the most magnificent parts of all Delphi. The theatre is cut in the natural slope of the rock and from it one looks out over the temple of Apollo and the other buildings and sees the valley of the river Plitus, with its olive-orchards. The mountains beyond rise in succeeding ranges and form the termination of this natural background. No scenery was needed in this theatre, and if the play grew wearisome one had but to lift the eyes and a panorama of natural beauty awaited that could not be duplicated from any theatre-seat in the world. This transcending beauty of the landscape brings the visitor to better realize the place Delphi held in the hearts of the people at the time of its splendor and how it won their support and protection through so many centuries.

Ruins of the Sacred Precinct.

The stadium is on a shelf-like formation farther up the side of the mountain, but is of little interest because it was rebuilt by the Romans. They added arch construction to the former Greek simplicity and in many places much of the Greek feeling is lost by these additions. The Romans defiled, as they did so many places, the sturdy and frank construction of the Greeks by their ornate and veneered architecture. The stadium is at the end of the winding path through the sacred precinct and completes all we can see to-day of Delphi, except the smaller group of temples farther down the mountain. These temples are in complete ruin. They were crushed by large masses of rock falling from the mountainside above.

The more interesting details and precious objects found during the excavating have been placed in a museum, built by the French, near the site of the temple of Apollo. This collection of sculpture and votive offerings is our heritage of all the grandeur and splendor that once existed at Delphi. Though located in an out-of-the-way part of the world there is still a message of inspiration to the interested, who will be well repaid for a pilgrimage to the shrine of the ancient oracle at Delphi.

For the architect to-day there is at Delphi a great inspiration and a storehouse of valuable information. One's interest is always enlivened, as the ruins are studied, by the fact that the works of art were executed in so many periods of Greek history. The same pile of ruins may contain a fragment of archaic art, a moulding with the spirit of the Golden Age marked in its contour, or a capital from the Roman period. Few other Greek centres were kept alive during so many centuries, so this comparative study is especially appreciated at Delphi.

Scattered throughout the ruins of the sacred precinct are fragments of the votive offerings, monuments, and temples. Only a small, irregular piece of marble sometimes, but on one edge a moulding is preserved as clear cut in its contour as the day it was fashioned by some Greek stonecutter twenty-five hundred years ago. Each stone has a message for architectural work to-day; each Greek curve will serve the modern architect as a guide in his constant strife for refinement of line and purity of detail.

With a scale and a pad of paper as the modern equipment and the memory of five centuries of Greek civilization as a companion, one can go about the ruins drawing, sketching, or measuring whatsoever is desired without opposition, except from the ever-present lizard, that watches, around the corner of the fragment under study, fearing the destruction of his historic haunts.

Profiles can be taken which will serve as helpful references in practice, for if the exactness of the line is not adhered to, but only studied, the architect will come to conceive the forms to-day in the spirit of the early purity and read into the modern work some of the subtleness that is still shown by the fragments of a time long ago.

The Competition for the Liberty Memorial at Kansas City, Missouri

By H. Van Buren Magonigle

THIS courage and loyalty so splendidly shown, this honor for which these patriots sacrificed their lives and their material interests—it is the memory of these which must be our inspiration for life in the new world revealed to us by the World War. Therefore, this design signifies—The Flame of Inspiration, guarded by the Spirits of Courage, Honor, Patriotism, and Sacrifice, burning forever upon an altar high erected in the skies, a pillar of cloud by day, a pillar of fire by night.

The uncertainty as to the function, size, and number of the buildings which may ultimately be placed upon this hill has determined a composition that shall not depend for any of its present effect upon the relation of any of these future structures to the memorial, which is the subject of this composition.

Hence the great axial mall of the simplest character, framed in trees.

To east and west of this any buildings may be built and yet be effectively united in a general composition without disturbing the sweep of lines leading to the memorial. The structures accessory to the memorial are, on the one hand, a building for the use of "those who came back," treated as a kind of fraternity chapter-house for reunions and rededication to the service of mankind, and on the other, a small museum for records and memorabilia.

The scale of the composition toward the station plaza is commensurate with this large area and with the distance of the memorial from the points in the plaza at which it is first completely visible.

The direction of the main axis was determined by these factors: It follows that line on each side of which cut and fill may be most readily equalized, and the fall of the ground utilized for lighting the lower stories of the buildings—as, for example, in the Art Building, which is intended to have, to the west, two full stories below the main-floor level. It unites very naturally two points of approach—the meeting point of the park roads on the top of the hill to the south, with the end of the Main Street Bridge to the north; and it creates available areas on the easterly side of the axis for some of the future buildings.

A commodious two-level subway, the upper level for pedestrians, the lower for service vehicles, service conduits, and the like, would connect and serve all the future buildings on both sides of the mall. The vehicular subway would be entered by way of the service road, which continues the line of Central Street, or from the park drive. The subway entrance for pedestrians would be under the Music Building from Main Street, and from the westerly side of the Art Museum, and would be (like the subway for service vehicles) connected by elevators with all stories of the buildings above, sparing the climb to the upper level in bad weather, or on those occasions when the object of the visit is special and not for the general purpose of enjoying the beauty of the terraced and shaded setting of the memorial.

This great æsthetic centre, serenely poised on its hill in the heart of the city's daily life, with the memorial standing at its gates, will be a constant reminder of the dominance of the things of the spirit.

The mural decorations of the memorial will be under the direction of Edith Van Buren Magonigle, President of the Woman's Society of Painters and Sculptors; the sculpture by Robert Aitkin.

By Bertram G. Goodhue

SO various are the site's possibilities, and so marvellous the vision to be realized, no more can be asked of a competitive design than that it faintly shadow forth what may be; therefore no finality is claimed for the drawings herewith submitted.

Two distinct liberties we have taken, attention to which should be drawn. First, the facing southward of the monument rather than toward the station; this because on its northern side any elaborate sculpture or surface treatment would, during most of the day, be lost in shadow, and because the central niche's swelling apse would, we believe, interest the passenger and connote in his mind the sanctuary it, in reality, would be. We have also naturalized the northern slope for the sake of the contrast between rough escarpment below and the studied finish above.

Second, we have boldly thrown an archway across Main Street, setting the "Legion Building" upon its farther side; a course since advocated in no uncertain words by an eminent sculptor.

Assuming the possible propriety and recognizing the certain expediency of thus adding to the site this inaccessible and therefore inexpensive property, it is obvious that a number of otherwise quite unattainable advantages are gained. In no other way can the main group be protected from commercial encroachment; and, placed here, the "Legion Building" akin to the rest, but more intimate and domestic in character, would stand in a domain all its own, a veritable country club in the heart of the city.

So exact is the acropolitan analogy, that our design has taken shape along lines, in general effect at least, "classic." Here our endeavor to ape the Greeks ceases, and we have not scrupled to seek inspiration from other lands and periods, and to draw freely upon our own fancy, for we hold that precedent should fade and tradition abdicate whenever and wherever they clash with modern needs and ideals.

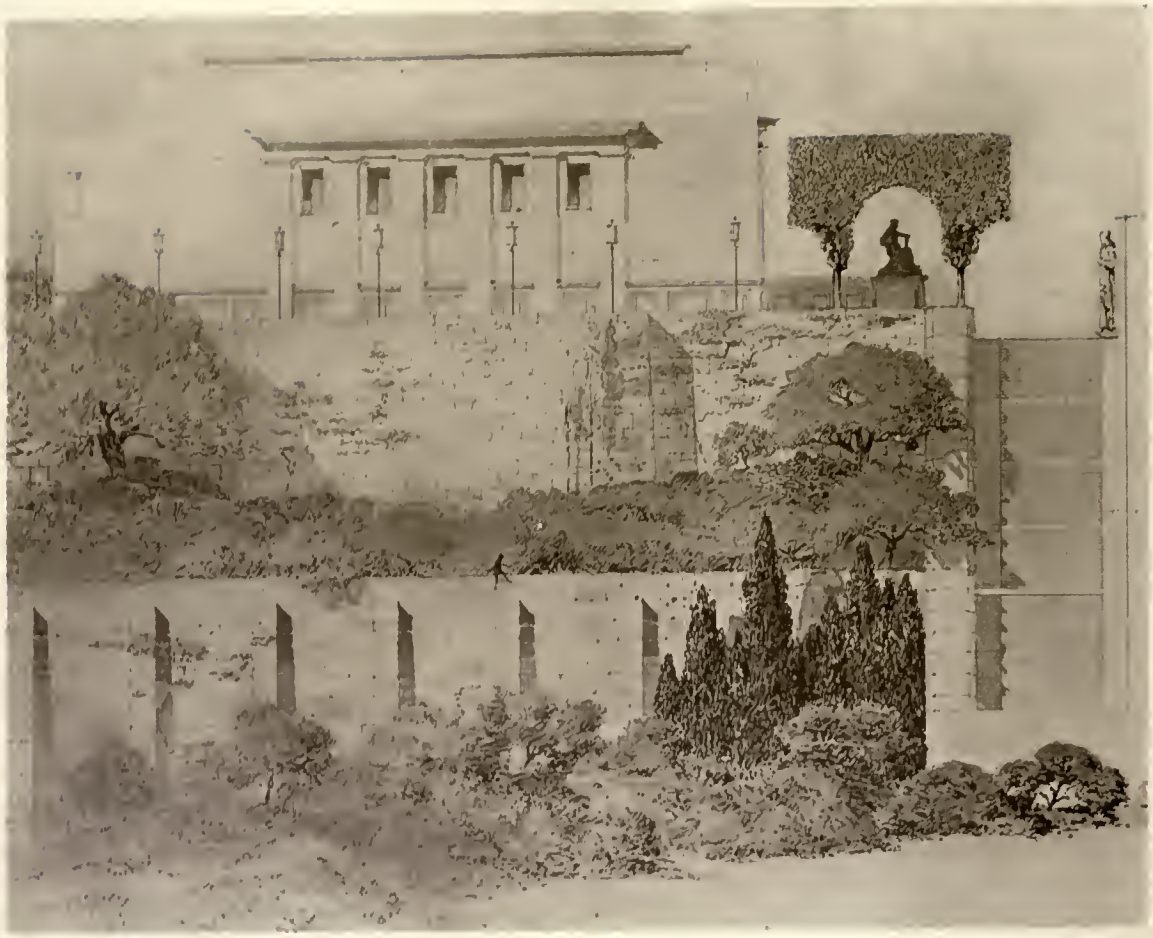
Since the use of local material was invariable in all great artistic periods of the past, as witness the Brick of Elam, the Syenite of Egypt, and the Pentelic Marble of Athens, we advocate the use of the same yellowish stone as that underlying the site. Friable and laminated at the surface, this culminates in a hard, almost white, limestone, comparable to marble. With ashlar of this and an infilling of solid concrete, the monument should be as enduring as those of antiquity.

Aiming fittingly to perpetuate the memory of those recently fallen to express our national love of liberty and to symbolize the "dawn of a warless age," we are yet constrained to regard such a "dawn" as still hid in the mists of the future, and, in this belief, have endeavored to express its ultimate certainty rather than present triumphant realization.

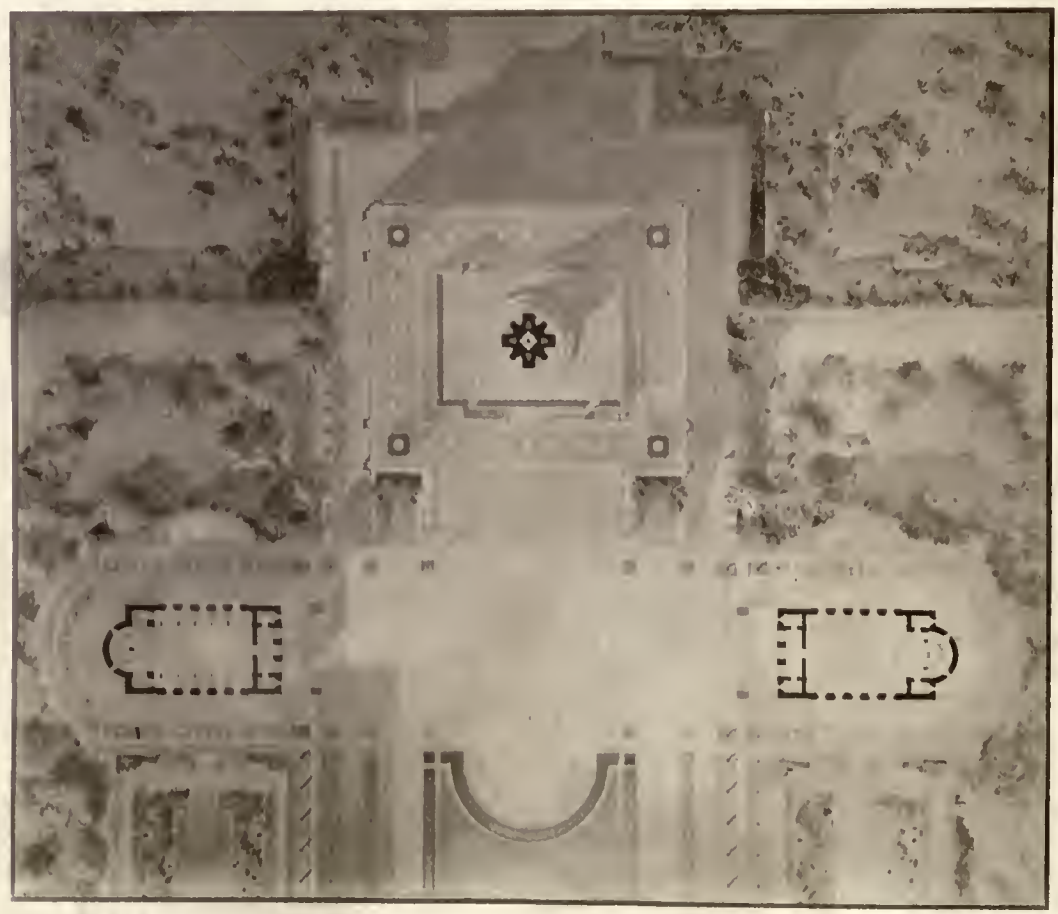
Stark, almost inaccessible at the north, the monument's southern face is its principal one, sequestered from what lies about it by a forecourt, wherein anniversary services and public gatherings might well be held, and whose arcades would provide space for minor, more personal memorials.

At the end of this court, instead of the traditional arch that signified the enslavement of a defeated enemy, rises a great pylon. At the base, below a relief picturing the august teachers of humanity, is the entrance to a domed

(*Continued on page 238.*)



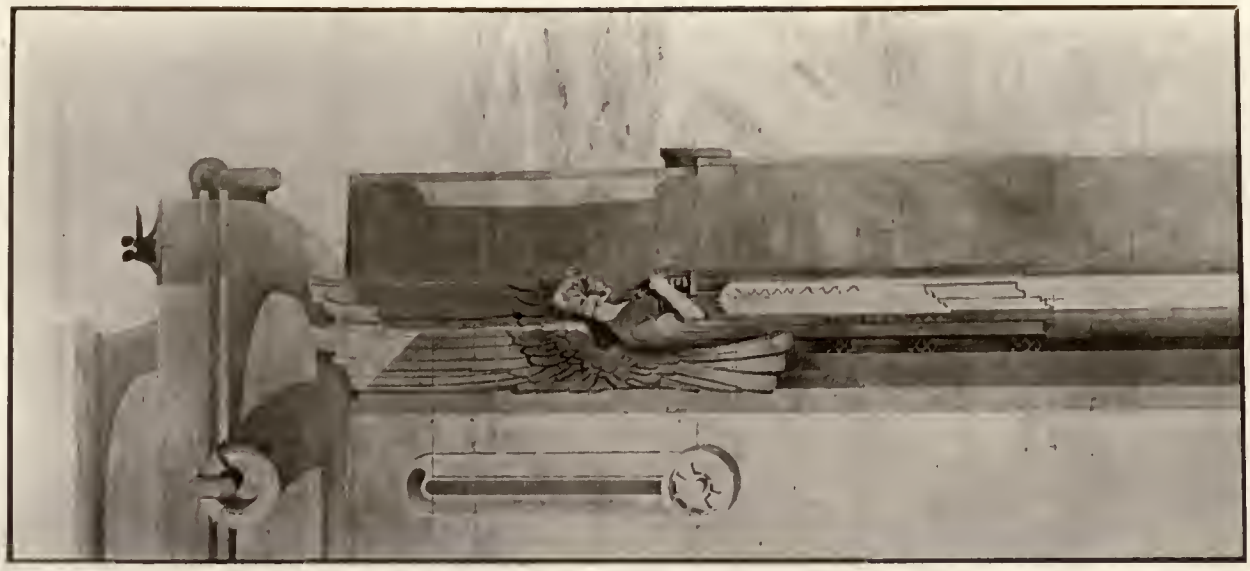
PART OF FRONT ELEVATION.



DETAIL PLAN.

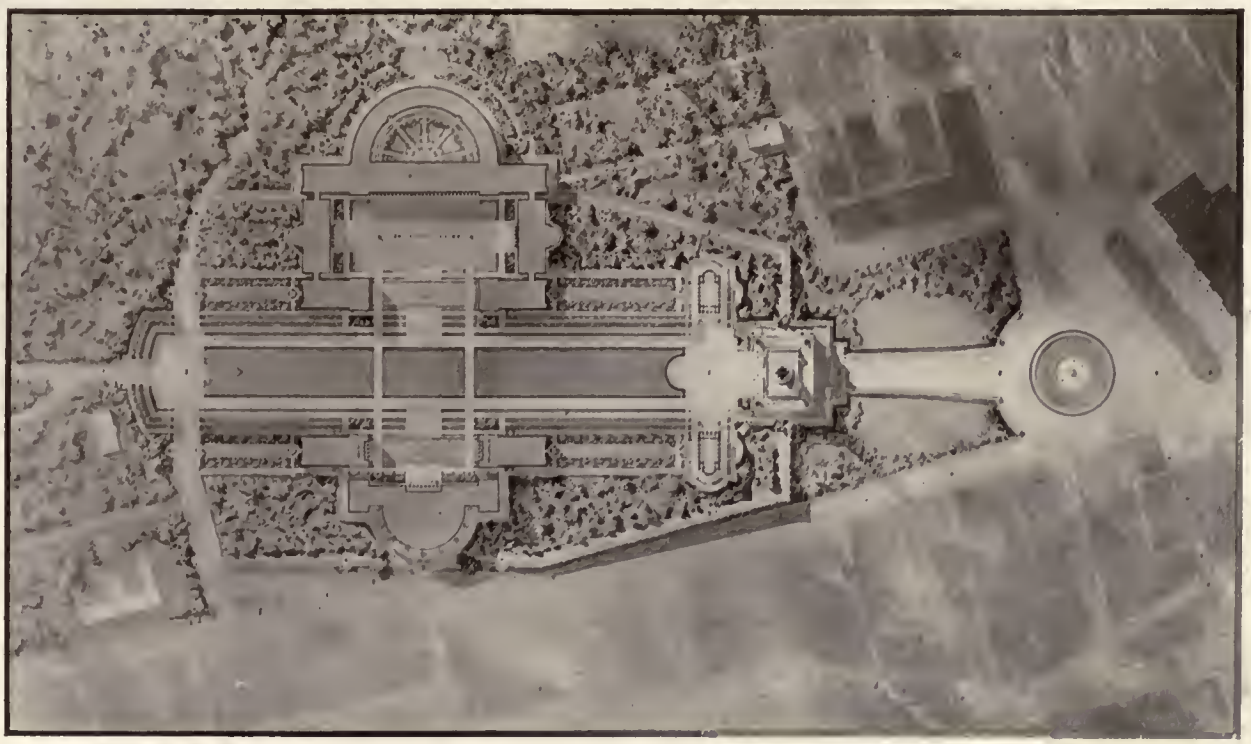
H. Van Buren Magonigle, Architect.

LIBERTY MEMORIAL, KANSAS CITY, MO.



DETAIL OF MONUMENT.

H. Van Buren Magonigle, Architect.



GENERAL PLAN.

LIBERTY MEMORIAL, KANSAS CITY, MO.

PERSPECTIVE.

(*Continued from page 235.*)

chamber, where upon a cenotaph rests a vast sword, fast-sheathed to symbolize the ending, not of the recent conflict only, but of all war, utterly and forever. Above its tile-lined niche, the simply incised inscription makes clear to even the most heedless, the meaning of the whole.

The sculpture for the monument, modelled by Lee Lawrie in association with Mr. Goodhue and carefully photographed to scale for the drawings, contributes a notable feature to the general design.

Flanking the great central recess are two seated figures, stony, hieratic, representing the two principles from which all life, and hence all achievement, is derived; the first grasps the Hammer of Toil and the Axe of Force, not lightly to be withdrawn from the Fasces of the Law; the second rests one hand upon the Book of Wisdom, with the other drawing closely to her the Youth, the eternal hope of all the world.

Gigantic as these are, they but serve to buttress the figure standing between them, vast, passionless, serene—Civilization, triumphant above the oblation of the slain.

The materials of which she is made, at first stone like the rest, change and become more precious. Her cloak is bronze, her flesh is creamy marble, her coronal, no mere regal device, but tier upon tier the mark of man's dominion over the elements, is gold. One hand is outstretched in benediction and appeal; the other grasps an enormous staff based upon the tortoise of slow-moving time and terminating in the steady flame of Perfect Liberty under Perfect Law, unquenchable throughout eternity.

For the rest—the other buildings, the formalized spaces, the series of tree-shaded pools, the driveways that co-ordinate and at this point terminate the city's beautiful and scientifically devised boulevard system, the fountain commemorating, perhaps, the historic Santa Fé Trail, the Propylæum with its view across the city and far into the west—all these are clear upon our drawings.

By Paul Philippe Cret

Associated with Zantzinger, Borie & Medary

THE Liberty Memorial stands at the city gate (the railroad-station) in an architectural setting such as the terraces of Piazza del Popolo, in Rome, and is by its restraint appropriate in character to the ideals it is proposed to commemorate. It rises from the Pershing Drive by an easy grade to the Commemorative Centre, at the foot of the retaining wall. Here may be held the city's commemorative ceremonies, or pageants, the spectators being massed on the two stands, the steps, and the terraces. The wall itself is an essential part of the memorial; its heroic bas-reliefs, its altar form, tell of the sacrifices made that peace may forever be. It is also appropriately the base of the Peace Statue, which towers above the activities of the city. From the Union Station the firm lines of the shaded walks and the big lawn culminate in this altar of sacrifice, and in the statue, thus forming an "ensemble" which does not have to wait for future appropriations to be complete and worthy of Kansas City.

The Veterans' Building has been placed so as to give the soldiers the impression that they are on their own grounds, in a pleasant club-house surrounded by its garden and overlooking the park. A bridge connects its main floor to the memorial proper, in order that the veterans may readily take their part in the exercises held in the Commemorative Centre. The bridge is also a covered carriage entrance to the auditorium on the ground floor. The offices and meeting-rooms of the patriotic societies are housed in the building, with such other rooms to make it an inviting centre for "those who came back."

On the hill will be grouped the buildings to house the highest manifestations of the intellectual life of the city.

Under the protection of the figure of Peace, an ordered, although not stiffly formal, group of buildings will form the modern acropolis of Kansas City. From the central plaza the view opens widely to the north and the valley of the river. Buildings are placed on the high retaining walls, which were such an element of beauty in the towns of the classical world, while on the west the less formal design blends the acropolis to the design of Penn Valley Park.

The three main groups—Fine Arts, Letters, Music and Drama—all have carriage access from every direction, and an access from Main Street level through an elevator entrance. Several lesser buildings could be devoted to private memorial foundations or meeting quarters of societies.

The connections between the drives of Penn Valley Park, the memorial group, and Main Street are secured through an effective system of ramps, giving interesting and ever-changing views of the composition.

The greatest care has been given to make the utmost of the topographical possibilities of the site by enhancing their value and securing a variety of aspects which would be unique; the placing of the composition on a single axis insures at the same time that directness and simplicity found in all great compositions.

By Greenebaum, Hardy & Schumacher

HOLDING in mind the dual character of the memorial as indicated by the programme, it was felt that expression of the ideal, as embodied in a symbol of peace, and the subservience of more practical purposes as attained in an edifice for the use of World War veterans, were best treated in separate units; that the domination of the spirit and feeling of peace as the inspirational idea of the scheme demanded some degree of isolation.

The solution, therefore, which we submit, comprises a monument and a memorial building, sufficiently distinct from each other to obviate any possible conflict between the symbolic and the utilitarian.

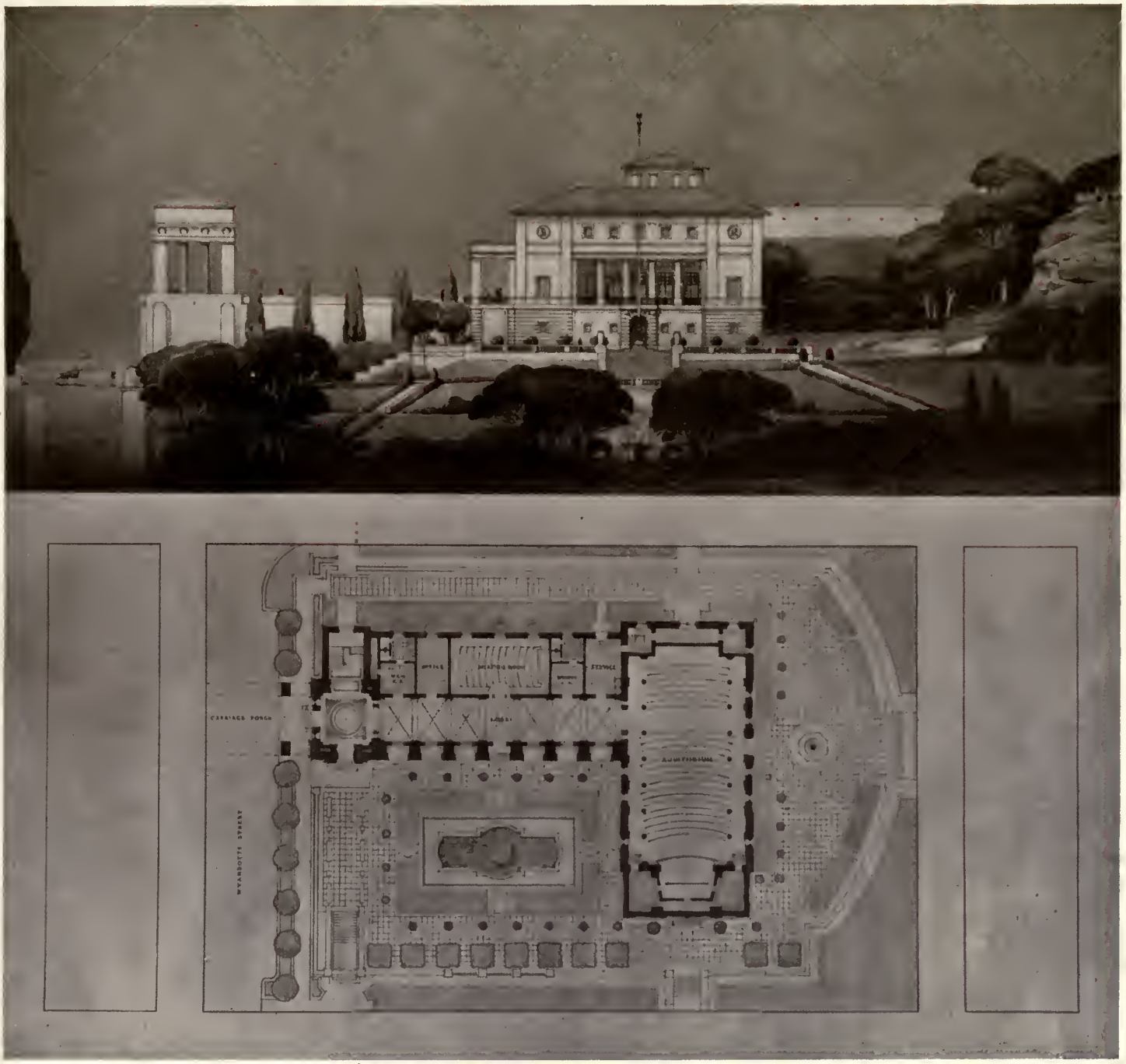
The twenty-eight columns flanking the four exterior walls of the memorial building symbolize the twenty-eight countries which lent their support to the allied cause in the World War.

An unsymmetrical group plan was adopted as best suited to the irregular shape of the site and the peculiar topography of the property. Such a parti lends itself to a more open scheme, affording an unobstructed view of the monument and memorial building from either approach. At the same time it permits of expansion or contraction in, and the rearrangement of, the art group as requirements of the future may dictate without impairing the view or dominance of the central motif, the monument.

The memorial building is placed on the existing promontory, and the retaining walls are almost exactly coincident with the present formations of the property. These walls, with the exception of those immediately below the memorial building, may be left for future development.

The south approach to the site is also an approach to the park, but an auxiliary east and west road immediately to the south has been indicated as an artery for heavier traffic.

In the preparation of the three-quarter-inch-scale detail the frieze has been shortened and other revisions made for the sake of composition, and to minimize the size of the drawing.

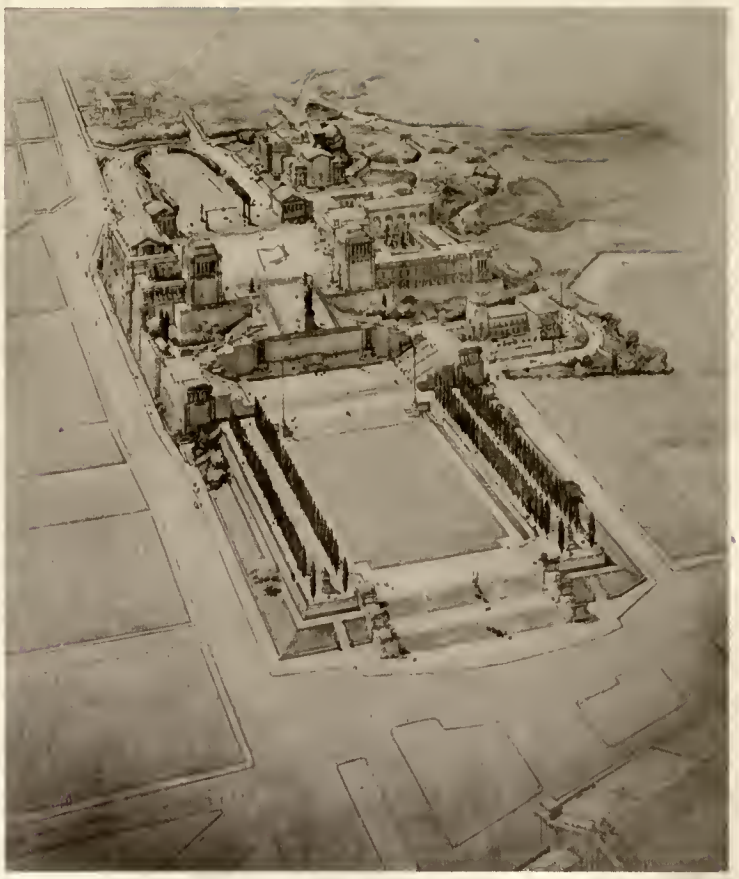


VETERANS' BUILDING AND PLAN.

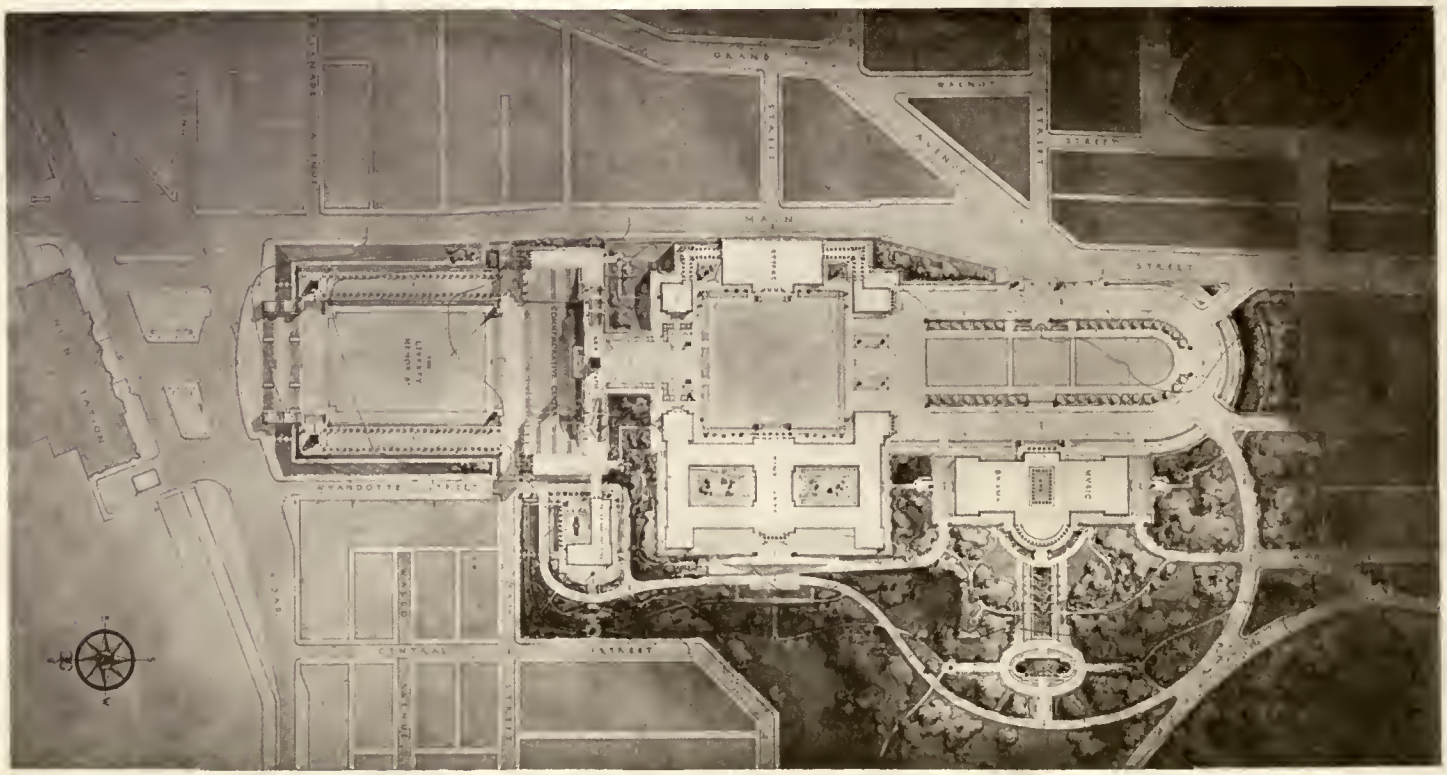
PERSPECTIVE. Paul Philippe Cret, associated with Zantzinger, Borie & Medary, Architects.

COMPETITIVE DESIGN, LIBERTY MEMORIAL, KANSAS CITY, MO.

DETAIL OF MONUMENT.



BIRD'S-EYE VIEW.



GENERAL PLAN.

Paul Philippe Cret, associated with Zantzinger, Borie & Medary, Architects.

LIBERTY MEMORIAL, KANSAS CITY, MO.

Editorial and Other Comment

As to Building

THE late Mr. Hamlet's problem was no more disturbing to his peace of mind than the one propounded above to the minds of many thousands in these modern times. We have, to be sure, no merely spiritual doubt to worry us; there is little of the pale cast of thought in the faces of the men who are "up against" this question, no mere mooning about things that are beyond earthly affairs. Our problem is one of purely material matters—no pun intended—and the high cost of labor. It would take a prophet with the wisdom beyond all records to say with any real assurance yes or no. Conditions in one place do not govern in others, except that in the great centres of business the cost of labor is practically the same. A prominent Western manufacturing concern recently sent out a questionnaire, with a result that only confirms the general feeling that there is no way to really determine just the right thing to do. Among the most important things that are holding up building are "labor disputes, material prices, labor costs, credits, unstabilized conditions, lack of confidence, freight rates," yes, individually and collectively, and other things too numerous to mention, and what are we going to do about it? There's the rub. According to many, the best that can be expected in the way of readjustment of prices will be a reduction to something like 100 per cent above those of 1913. Who can tell?—it is all guessing. Many who are waiting will be left at the post, and many who plunge ahead may find themselves wishing they had been. To those who can look back on the days when there seemed a more united America, when English was the familiar language of artisans of all kinds, and an appeal to patriotism meant something besides getting a dollar—times were different. We feel that this question of building, of providing places for people to live, is as vital to our national welfare as the building of ships and the doffing of hats at the passing of the flag. What we are in need of is a realizing sense of the disturbing power of the alien-labor element, and, too, of the grafting and conscienceless methods of all kinds of profiteers.

Labor will not believe what the capitalists say regarding the need of reduced wages, and the great financial institutions and individual lenders of money are fearful of mortgage loans based upon present inflated costs. And there you are!

Our private opinion is that about the only way to arrive at any satisfactory issue is to go ahead and build. Mr. Bossom quotes very aptly from General Grant, "the way to resume is to resume." From all we can gather from various sources, there will never be a return to pre-war prices. We have adjusted ourselves fairly well to the greatly increased cost of living in general; why not plunge and get the parade started on a concerted building programme that will compel better price adjustments? Unless labor has completely lost its senses, and capital its initiative, something is going to happen—must before very long.

We believe that much of the uncertainty existing is based not upon insurmountable conditions, but chiefly upon the lack of seasoned courage to make a beginning. Some one is going to beat you to it. If a few more Oleans get busy (see page 249), we shall never have to write another editorial that may not be expressive of equal optimism.

The Effect of Tax Exemption in New York

RECENT statistics regarding the effect of the tax-exemption law in New York are encouraging. There has been quite a marked improvement in building over last year, and if capital can be convinced that it is good business to lend money for building, another six months will show still greater progress.

"Homes to accommodate 20,897 families and to cost $100,000,000 have been planned since the tax-emption law advocated by Borough President Henry H. Curran took effect, according to the records of the building bureaus of the five boroughs, made public by him recently. He urged public-spirited citizens to come to the aid of the home-builder by loaning money on first and second mortgages.

"The period covered by the figures is from February 25 to July 9. For the same period last year only $37,143,000, providing for 6,604 families, was invested in homes. The following table shows the character of houses and distribution of the families provided for in the $100,000,000 list:

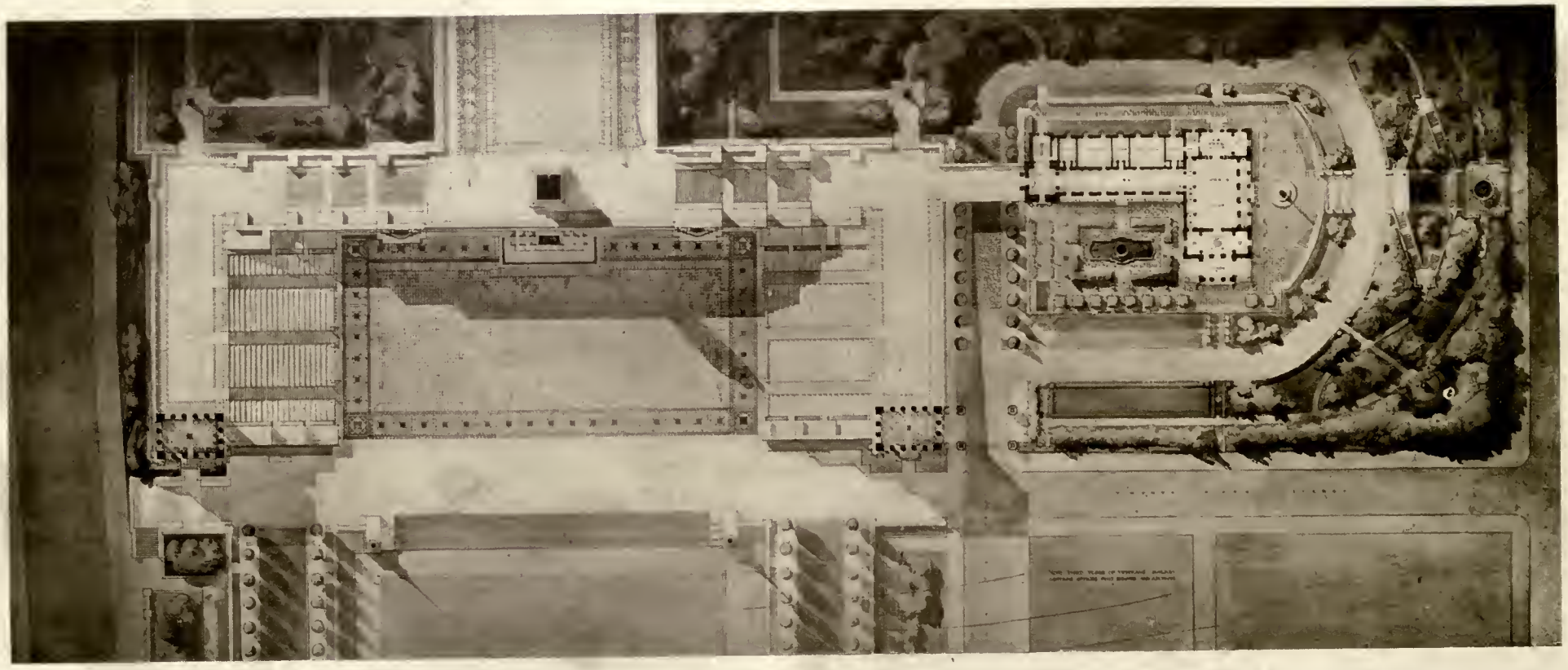
	HOUSES	APARTMENTS	TOTAL
Manhattan	104	1,740	1,844
Brooklyn	5,314	3,166	8,480
Bronx	966	3,481	4,447
Queens	4,453	608	5,061
Richmond	1,065	0	1,065
Totals	11,902	8,995	20,897

The Liberty Memorial at Kansas City

THE competition for the Liberty Memorial at Kansas City, Mo., that has been decided in favor of the plans submitted by H. Van Buren Magonigle, brought forth a number of notably distinguished and original designs. We are privileged to publish in this number those of the winner, together with those of the three other competitors whose work met with the highest praise.

They all show a wholesome, vital tendency to get away from purely traditional forms and styles, to make architecture more an expression of our own times, of American ideals, of the noble purposes the memorial commemorates. The theses that accompanied the drawings are also published in this number, and express better than anything we might say the motives that animated the competitors and the inspiring purposes that governed them in their creations.

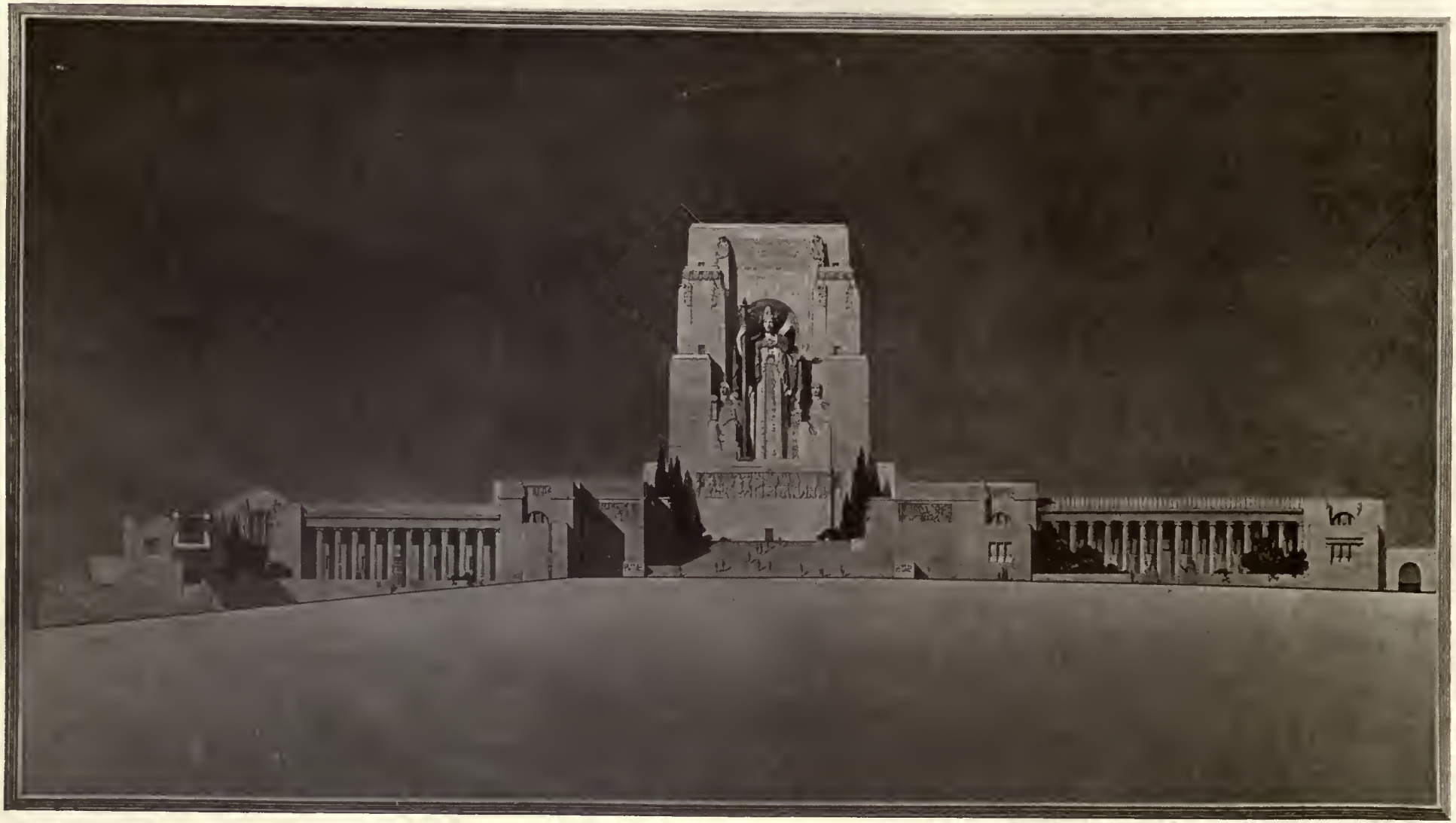
FRONT ELEVATION OF MONUMENT.



DETAIL PLAN.

Paul Philippe Cret, associated with Zantzinger, Borie & Medary, Architects.

LIBERTY MEMORIAL, KANSAS CITY, MO.



FRONT ELEVATION OF MONUMENT, LIBERTY MEMORIAL, KANSAS CITY, MO.

Bertram Grosvenor Goodhue, Architect.

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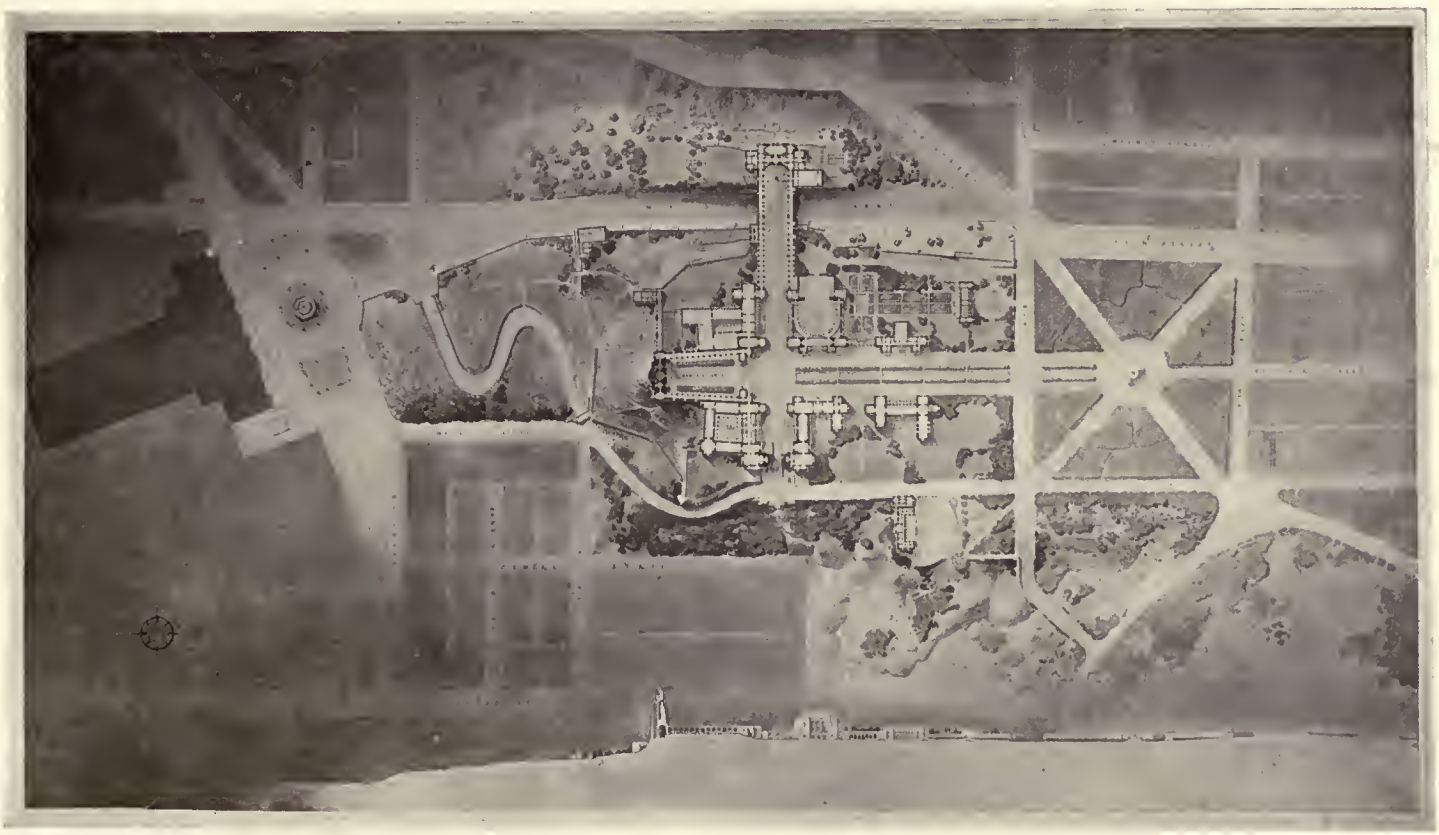
SIDE OF MONUMENT.



GENERAL PLAN.

Bertram Grosvenor Goodhue, Architect.

LIBERTY MEMORIAL, KANSAS CITY, MO.

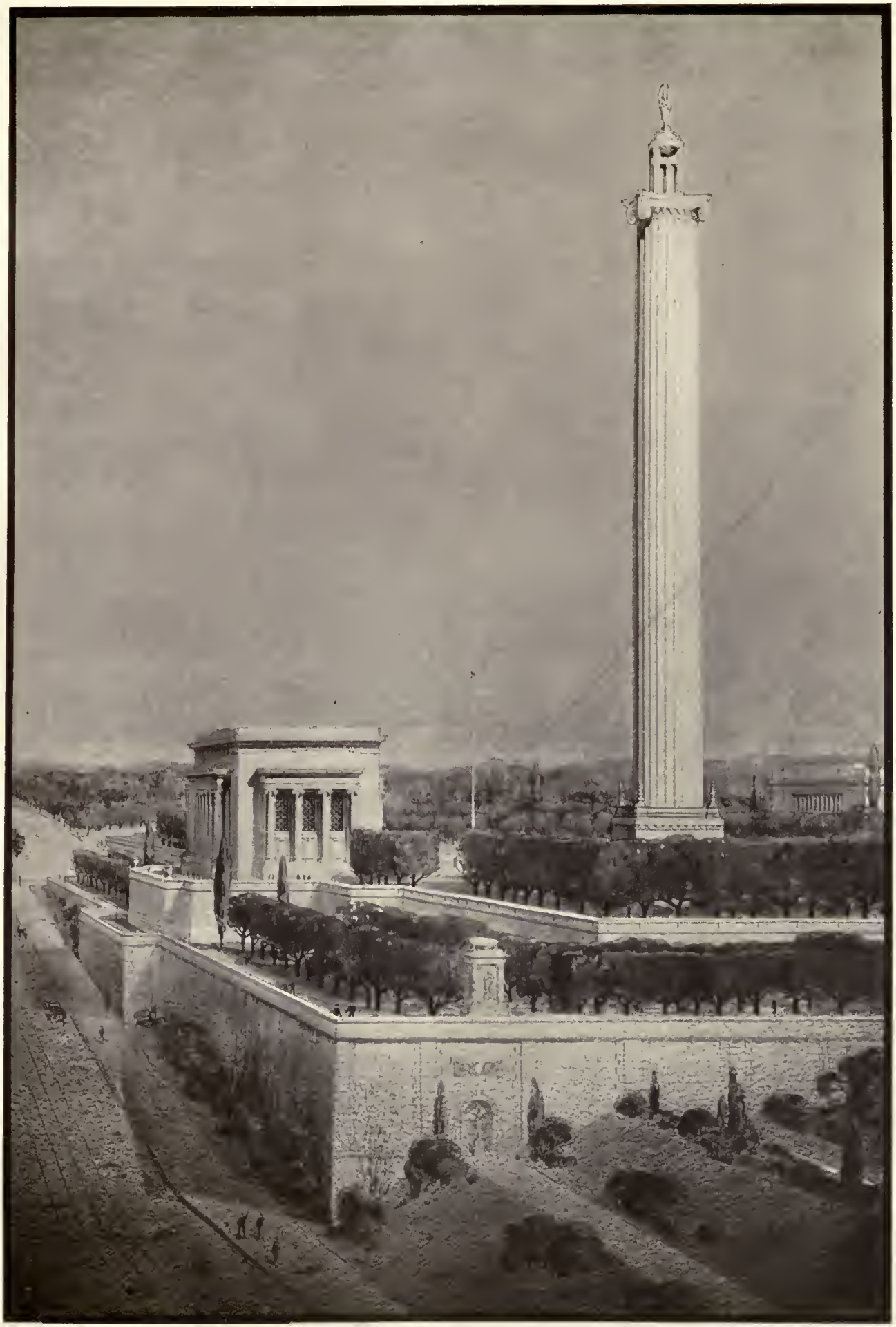
DETAIL OF MONUMENT.

PERSPECTIVE.

REAR OF MONUMENT.

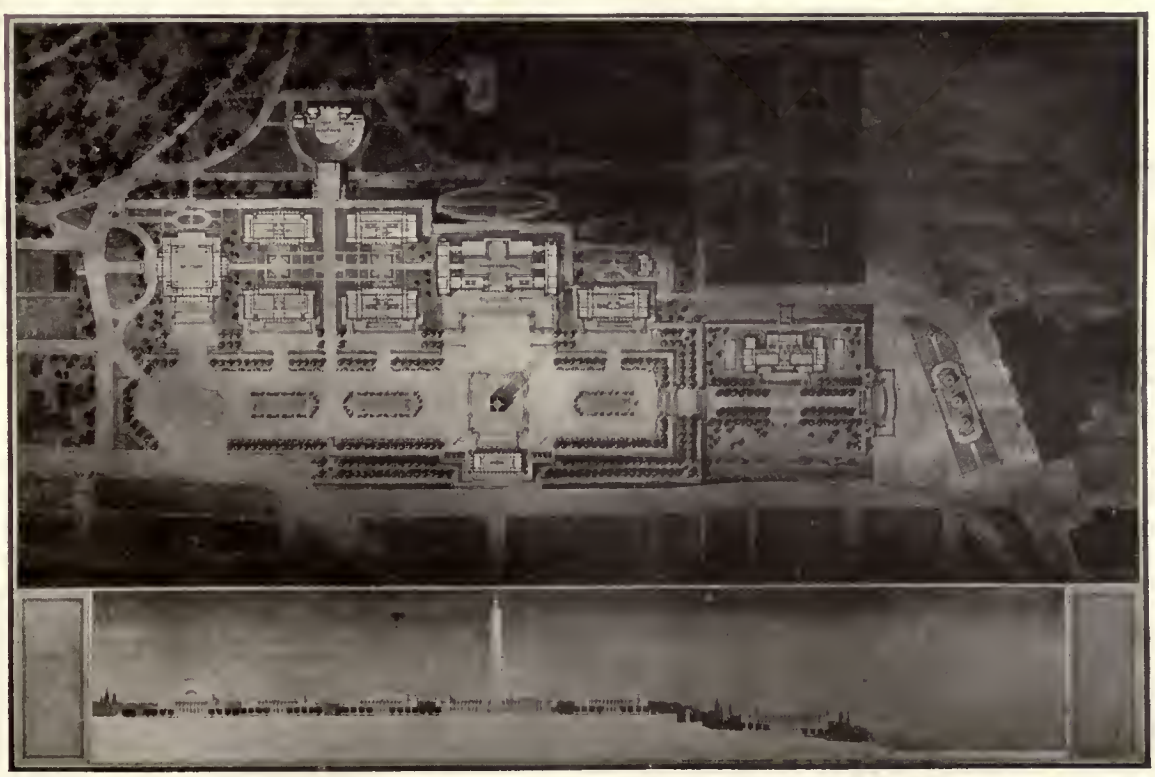
Bertram Grosvenor Goodhue, Architect.

LIBERTY MEMORIAL, KANSAS CITY, MO.



PERSPECTIVE, LIBERTY MEMORIAL, KANSAS CITY, MO. Greenebaum, Hardy & Schumacher, Architects.

FRONT ELEVATION OF MONUMENT.

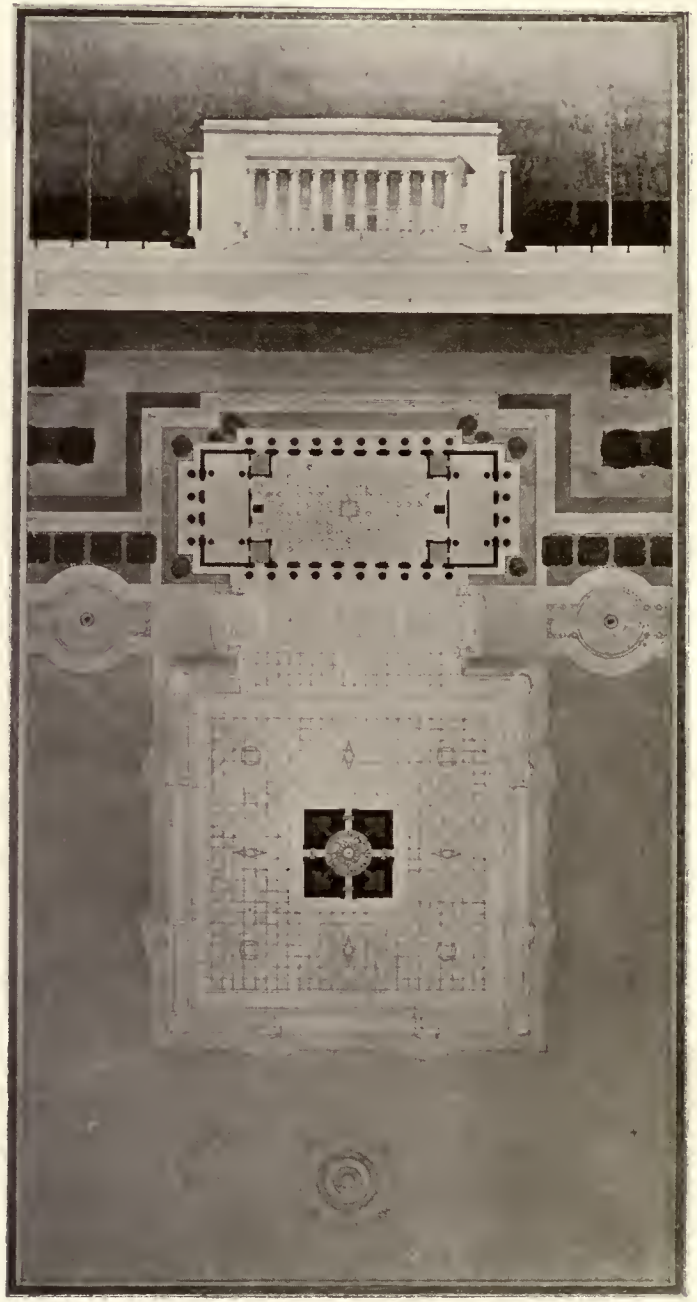


GENERAL PLAN.

Greenebaum, Hardy & Schumacher, Architects.

LIBERTY MEMORIAL, KANSAS CITY, MO.

DETAIL OF MONUMENT.



BUILDING AND PLAN.

Greenebaum, Hardy & Schumacher, Architects.

LIBERTY MEMORIAL, KANSAS CITY, MO.

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BANKING-HOUSE, S. W. STRAUS & CO., FIFTH AVENUE AND 46TH STREET, NEW YORK.

Warren & Wetmore, Architects.

242 5

ENTRANCE DETAIL, BANKING-HOUSE, S. W. STRAUS & CO., FIFTH AVENUE AND 46th STREET, NEW YORK.

Warren & Wetmore, Architects.

BANKING-ROOM.

ENTRANCE STAIRWAY TO BANKING-ROOM. Warren & Wetmore, Architects.

BANKING-HOUSE, S. W. STRAUS & CO., FIFTH AVENUE AND 46TH STREET, NEW YORK.

OFFICES, SOUTH SIDE OF BANKING-FLOOR.

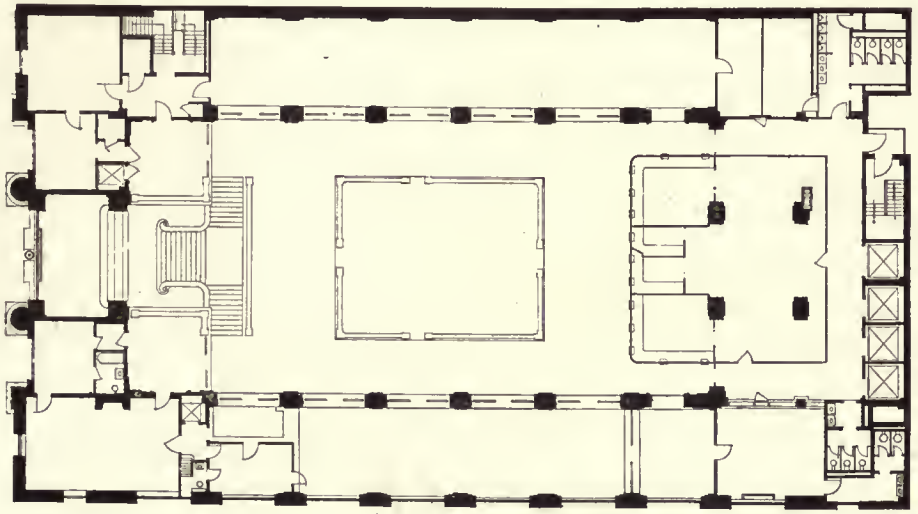
BANKING-ROOM.

Warren & Wetmore, Architects.

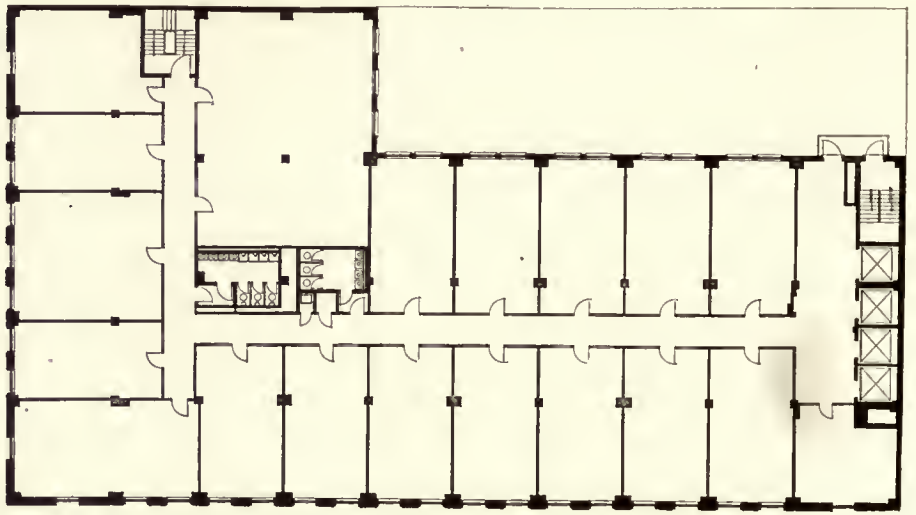
BANKING-HOUSE, S. W. STRAUS & CO., FIFTH AVENUE AND 46TH STREET, NEW YORK.

MR. STRAUS'S ROOM.

DIRECTORS' ROOM.



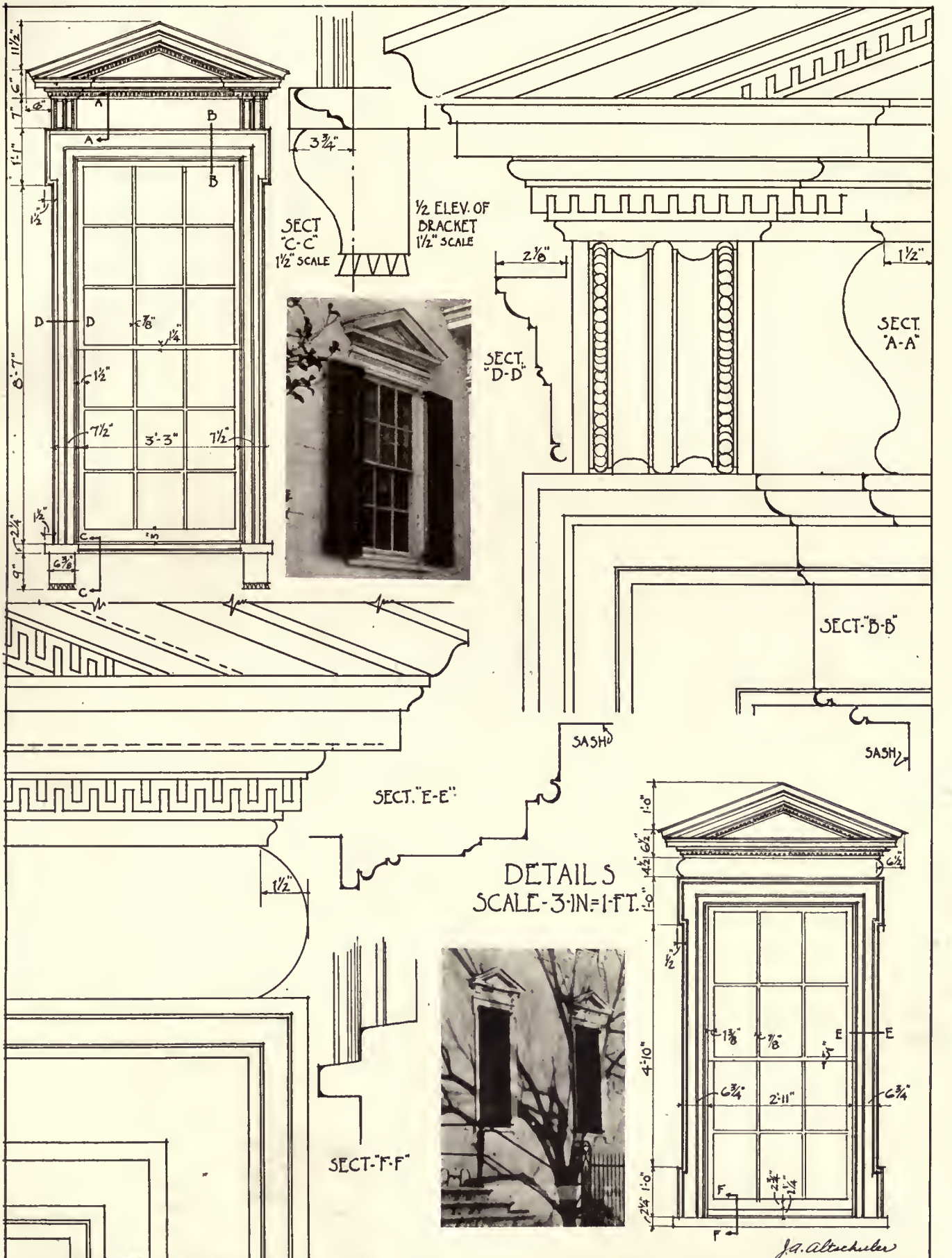
BANKING-FLOOR PLAN.



TYPICAL FLOOR PLAN.

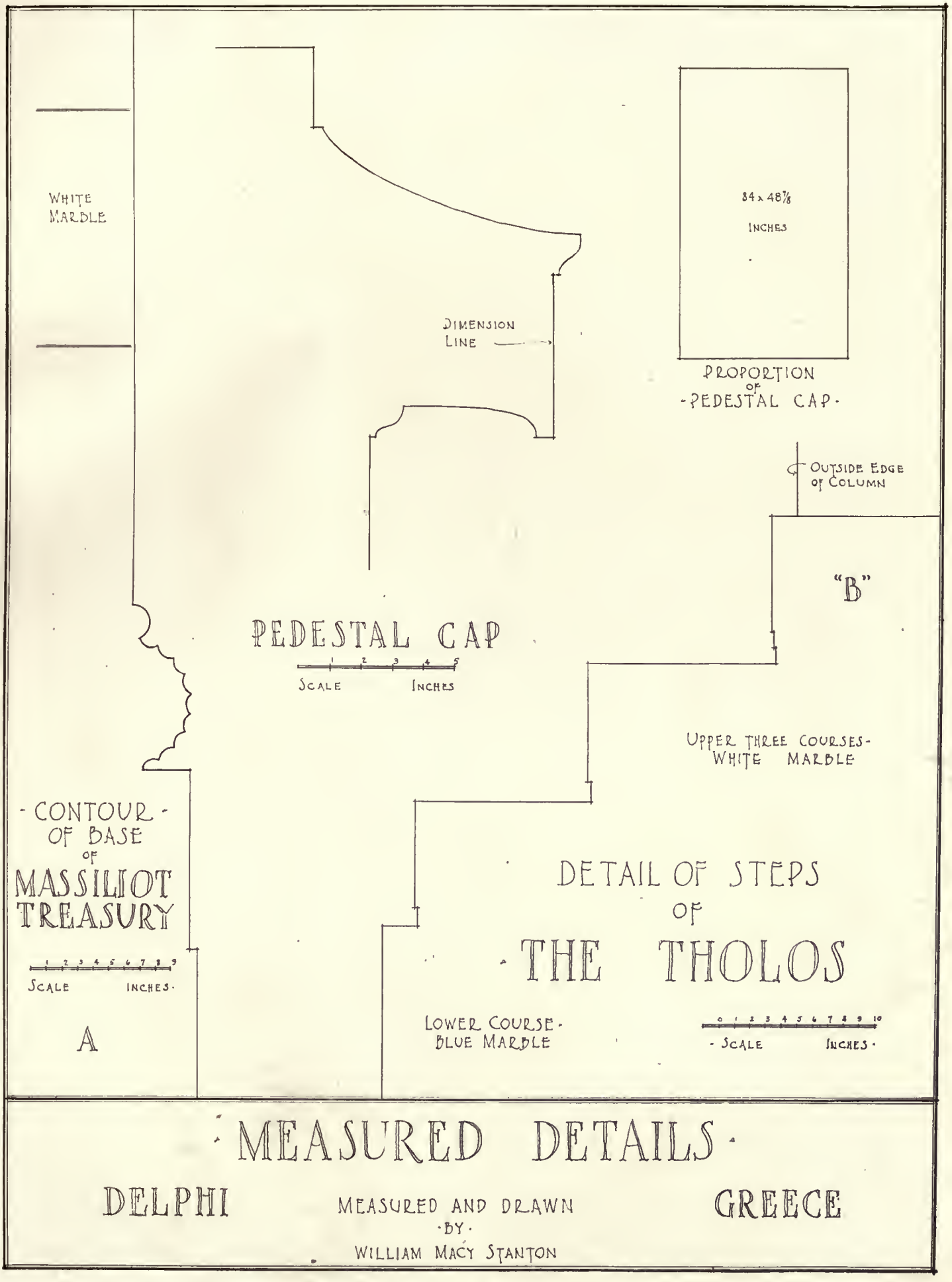
Warren & Wetmore, Architects.

BANKING-HOUSE, S. W. STRAUS & CO., FIFTH AVENUE AND 46TH STREET, NEW YORK.



COLONIAL ARCHITECTURE of the CAROLINAS	WINDOW-1772- 104 TRADD ST. CHARLES'N-S.C. " 1801 - BRYAN HOUSE - NEW BERN-N.C.	MEASURED & DRAWN by J.A. ALTSCHULER

242 3



MEASURED DETAILS

DELPHI — MEASURED AND DRAWN BY WILLIAM MACY STANTON — GREECE

(See "Delphi and the Oracle," pages 231–234.)

241.4

RESIDENCE, MRS. ALICE McLEAN, 125 EAST 54th STREET, NEW YORK. De Suarez & Hatton, Architects.

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LIVING-ROOM, RESIDENCE, MRS. ALICE McLEAN, 125 EAST 54TH STREET, NEW YORK. De Suarez & Hatton, Architects

FOUNTAIN AND CENTRAL MOTIF OF GARDEN.

DETAIL OF DINING–ROOM WINDOW.

De Suarez & Hatton, Architects.

RESIDENCE, MRS. ALICE McLEAN, 125 EAST 54TH STREET, NEW-YORK.

ENTRANCE PASSAGE.

HALL, FIRST FLOOR.

STAIR HALL.

DINING-ROOM LOOKING TOWARD STAIR HALL.

RESIDENCE, MRS. ALICE McLEAN, 125 EAST 54TH STREET, NEW YORK CITY.

De Suarez & Hatton, Architects.

The McLean Residence

De Suarez & Hatton, Architects

THE attempt to solve manifold problems and an effort to revive certain traditions and traditional expressions in architecture lends special interest to the structural alterations of this house. A glance at the plans does not apparently justify any reason why any or part of the two old brownstone houses, lying on the north side of East 54th Street, should have been kept as a foundation for the thoroughly modern residence, into which they have been transformed.

Yet in this use lies the particular interest of this piece of work. It has been the tendency in recent years to devote a great deal of architectural activity to the improvement of old New York real-estate property in the zones east of Park Avenue by transforming rather than rebuilding existing residences, and, in contrast with houses nearer Fifth Avenue, to take advantage of the open back yards to add to these modernized dwellings the hitherto practically unknown charm of a city garden.

Mrs. McLean's residence, although the word "alteration" hardly describes it, identifies itself closely with this programme. Covering as it does about half the area of the property, it leaves open for enjoyment a comparatively large space of ground in the rear, which, in the manner of a European city house, "hôtel particulier" or "palazzina," is overlooked by the main rooms of the house.

The use of stone detail contrasting with stucco and plaster surfaces, both internally and externally, would link it with the Italian tradition of substantial construction typical of the domestic as well as the monumental architecture in that country.

To obtain a few large rooms, as high as circumstances and proportions permitted, directness and simplicity of plan and a continuity of style in the treatment of decorative forms have been obviously the constant aim of the architects. In creating the impression of bare spaciousness and in seeking the value of a certain "emptiness," they intimately connected their work with the true expression given by the Italian architects of the best periods. Even when building on small scale, the masters of the past always seem to have conveyed the sense of bigness and the dignity of large, void spaces. This characteristic impression, given by the palace or the church, was reflected in the smaller dwellings, and, except where, as in the gaily decorated rooms of the baroque period, a frankly playful effect was looked for, the whole of Italian architecture is noted for its broadness and simplicity of treatment, as well as the admirable logic in the use of decorative detail.

The study of the forms, so seldom looked at or sufficiently appreciated, of that great period, which in architecture followed the Renaissance, has been a source of inspiration for the architects of Mrs. McLean's residence. Until recent years few have devoted much attention to this period and it is strange that it should have been so profoundly ignored and disregarded when, on the whole, the "Cinquecento" and "Seicento" offer us countless examples which could be wonderfully adapted to our modern needs and manners of living.

The masterpieces of Vasari, Ammanati, Buontalenti, Vignola, and others as late as Longhena and Bernini are, architecturally speaking, to the great public, only literary curiosities. It is to be regretted that the golden period of the Renaissance and even the late Gothic should have received so much attention from architects and students who apparently seldom realize the futility of a logical revival of their forms in our days; while buildings which offer unlimited material for adaptation remain entirely unknown. Tuscany, the Veneto, the Roman territory, offer endless buildings of all descriptions, country villas, town palaces, churches, gardens, and farmhouses, a veritable gold-mine as yet almost untouched.

The accompanying illustrations show the main points of interest in the house. The small vaulted vestibule gives direct access from the street to the central hall, twenty-four feet high, with vaulted ceiling and overlooked by windows from the library and living-room. A short flight of steps leads directly into the dining-room, all white stucco and "red Verona" marble trims and mantel-piece, and thence into the garden.

The main staircase starts from the hall, double at first, intramural in its second flight, and gives access to the upper hall, which opens directly on the library and reception-room on one side and the main living-room on the other. The ceiling of this room, twenty-two feet high, offers an example of Tuscan vaulting of the period, with the sharply defined edges of the penetrations.

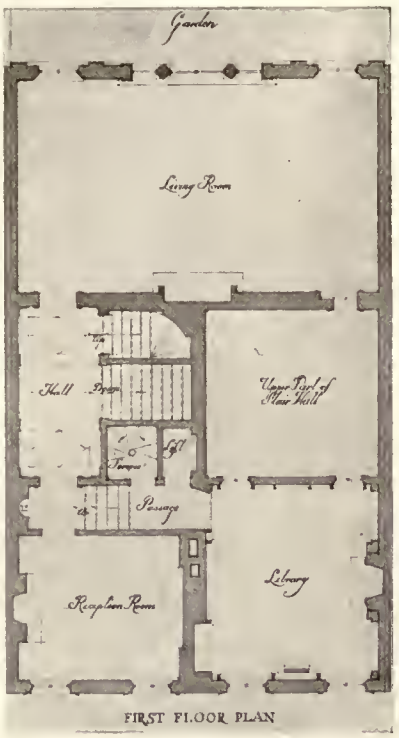
A minor staircase goes up to the owner's apartment boudoir, bedroom, and bathroom, worked out in the front of the house in the corresponding upper portion of the living-room in the rear.

An enclosed court, occupying the central portion of the house, comes down as low as the second floor and gives ample light to all inside rooms. The third floor of the house is entirely devoted to guest and bed rooms, and the fourth floor is occupied by servants' rooms and a laundry. The lift and service staircase are entirely enclosed in terra-cotta partitions, forming a sort of fire tower in the centre of the building.

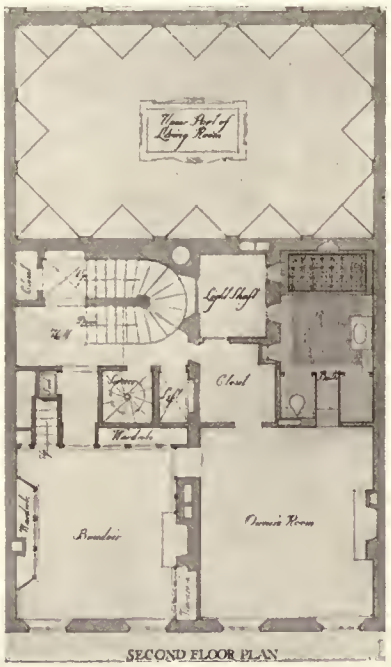
The artificial blue stone used throughout the house, contrasting sharply against the white stucco in the interior, is about the same shade of color as the one typically used in Florence.

The bedrooms are mostly colored stucco with a cove instead of cornice carrying the material of the wall into the ceiling. The stucco on the front and rear façades is light orange in color.

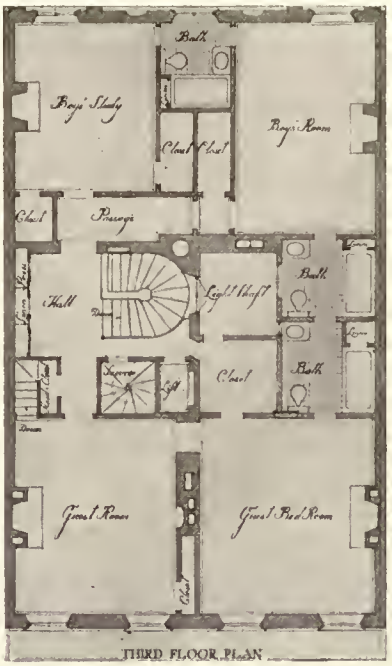
The owner's bathroom walls and vault are very light pink, and the floor and lining of the sunken bathtub have been carried out in Tunis tiles.



FIRST FLOOR PLAN

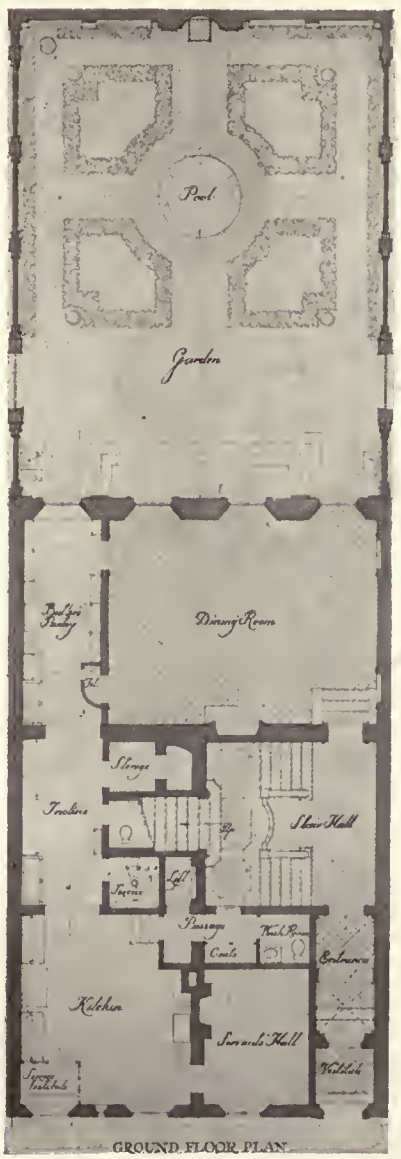


SECOND FLOOR PLAN



THIRD FLOOR PLAN

REAR OF HOUSE AND GARDEN.



GROUND FLOOR PLAN

De Suarez & Hatton, Architects.

RESIDENCE, MRS. ALICE McLEAN, 125 EAST 54TH STREET, NEW YORK CITY.

Concrete Construction

By DeWitt Clinton Pond, M.A.

SEVENTH ARTICLE

IN the section of the 395 Hudson Street Building which has been under discussion in the previous articles, there are nine panels and sixteen columns. The design of the columns has been investigated as well as that of the footings under most of the columns. There remain three footings, under columns 13, 14, and 15, to be checked. The footing plan, shown in Fig. XI in the fifth article of this series, as well as the detail of the continuous footing under these columns, indicates that the part of the footing between columns 15 and 14 should be considered as continuous, while that part between columns 14 and 13 would be semi-continuous, and the part at the end beyond column 13 is a cantilever.

As in the case of the continuous footing under columns 9, 10, 11, and 12 an average load will be taken as applying to the design of the footing under columns 13, 14, and 15. The average load will be considered as 1,000,000 pounds and the weight of the footing itself as 90,000 pounds, making a total weight of 1,090,000 pounds.

The soil, being 4-ton soil, must have an area equal to $1{,}090{,}000 \div 8{,}000 = 136.2$ square feet. As the columns are set 20 feet on centres the footings must be considered as only 20 feet long, so the width is found by dividing 136.2 by 20. This gives a width of 6.81 feet or 6 feet 10 inches. The actual area of the footing will be 136.6 square feet and as only the downward pressure of the columns is considered as producing shear or bending in the footing, the upward unit pressure of the soil which will have this effect will be $1{,}000{,}000 \div 136.6 = 7{,}320$ pounds per square foot.

The first part of the footing which will be designed will be that part between columns 15 and 14, which will be considered as continuous. Fig. I, in the first article, showed the floor plan of the section of the building under consideration. In this figure is shown the wagon-court, and the columns adjacent to it are shown as having their long dimension perpendicular to the building line to give as much space in the wagon-court as possible. The width of the columns at the first floor was made 2 feet 6 inches. This width became 2 feet 10 inches in the basement. The clear span between columns becomes, therefore, 17 feet 2 inches. The load on this span will be $17.17 \times 7{,}320 \times 6.83 = 858{,}500$ pounds. The condition of loading is shown in Fig. XVIII. It will be seen that the reactions are each one-half of this total load, or 429,300 pounds. The total moment is given by the following calculation:

$$429{,}300 \times (10 - 4.29) = 2{,}451{,}300 \text{ foot-pounds.}$$

To reduce this moment to inch-pounds and to the proper moment for a continuous footing it will be necessary to multiply by 12 and by two-thirds. This will give a moment of 19,610,000 inch-pounds.

At this point it might be well to check to find the proper depth of the footing. In order to do this it will be necessary to find the moment for each foot of width of the footing. The footing is 6.83 feet wide, so the moment per foot will be $19{,}610{,}000 \div 6.83 = 2{,}871{,}000$ inch-pounds.

$$d^2 = 2{,}871{,}000 \times 8 \div 1{,}462.5 \times 7 = 2{,}250.$$
$$d = 47.5 \text{ inches.}$$

The total depth of the footing will be $4\frac{1}{2}$ inches more than this, or 52 inches.

The remaining point to be considered is the determination of the stress in the steel. This is accomplished by multiplying the moment in inch-pounds by 8 and by dividing by $7d$.

$$S = \frac{19{,}610{,}000 \times 8}{7 \times 47.5} = 471{,}800 \text{ pounds.}$$

$$\frac{471{,}800}{16{,}000} = 29.5 \text{ square inches.}$$

If 29.5 square inches of steel are required, it will be necessary to have 19 bars measuring $1\frac{1}{4}$ inches square. Of these, 10 will be straight and 9 will be double bent. It will be necessary to add one bar at the bottom of the footing in order to have the same number of bars for the negative moment as for the positive moment.

The next step is the determination of the size and number of stirrups. The reaction at the columns was found to be 429,300 pounds. By dividing by the *effective* area—$\frac{7}{8}\ bd$.—it will be possible to determine the shear per square inch.

$$429{,}300 \div (\tfrac{7}{8} \times 82 \times 47.5) = 123 \text{ pounds per square inch.}$$

This is slightly over the allowable shear for reinforced concrete as required by the Joint Committee, but for the purpose of this design it will be considered safe. Forty pounds will be allowed to the concrete and 83 pounds must be taken care of by the steel. The proportion of the length of the clear span over which the shear will be applied will be ratio between 83 and 123. The clear span in 17.17 feet or 206 inches and the width of the footing is 82 inches, so the number of square inches over which the shear will act will be found by the following equation:

$$\frac{83}{123} \times 206 \times 82 = 11{,}400 \text{ square inches.}$$

The *average* shear per square inch over this area is 41.5 pounds, and the total shear will be $11{,}400 \times 41.5 = 473{,}000$ pounds.

The stirrups are made up of $\frac{1}{2}$-inch round rods bent so that there are four vertical legs and having a total area of steel of .7852 square inches. The steel, having a value of 16,000 pounds per square inch, will have a value of 12,580 pounds per stirrup. As there are 473,000 pounds to be counteracted by the steel it will require $473{,}000 \div 12{,}580 = 38$ stirrups, provided that the stirrups alone were to act. However, the bent-up steel is effective for the purpose of withstanding horizontal shear.

There are 9 bent-up bars each having an area of 1.5625 square inches. The total area of these bars is 14.06 square inches. Seven-tenths of this area is 9.84 square inches, which is the effective area of the bent-up steel for resisting shear. One stirrup has an area of .7852 square inches, so the bent-up steel will have an area equivalent to 12 stirrups. The steel is bent up at both ends and therefore it will take the place of 24 stirrups in the length of the footing. It will

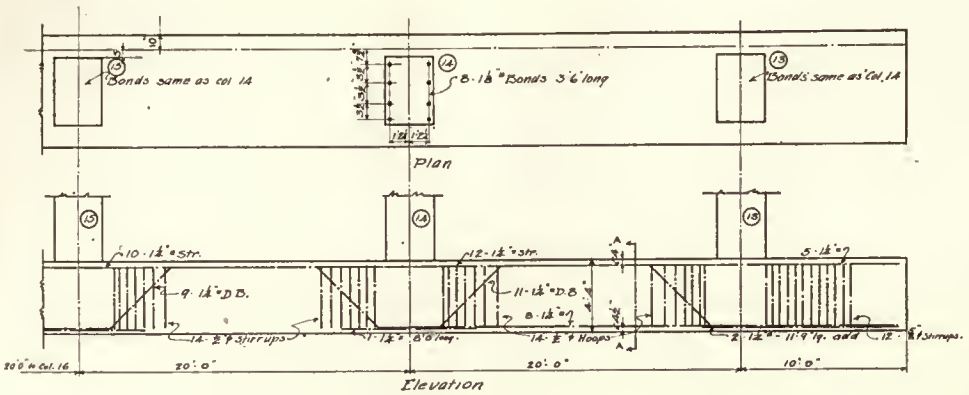


FIG. XVII

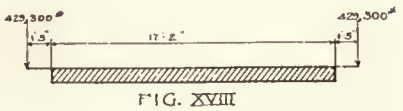
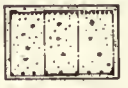


FIG. XVIII



Section A-A

FIG. XIX

be necessary to have only 38 − 24 = 14 stirrups between columns, or 7 at each end.

It might be well to note at this point the reason for considering that seven-tenths of the bent-up steel can be used to withstand the horizontal shear. Theoretically, the steel is supposed to be bent up at the point of inflection, where the positive moment changes to negative or the negative changes to positive. At this point there is no moment at all and there is no stress on the steel at all. In practice this condition does not exist. However, it is safe to assume that at least one-half of the bent-up steel will not be stressed, and this half can be used to counteract the horizontal shear.

Now if the text-books are consulted it will be found that steel inclined at an angle of 45 degrees, in the same manner as the bent-up steel, is considered as being more efficient to resist the stresses set up by the shearing forces. The vertical steel is considered as being only .70 times as efficient, area for area, as the steel inclined at an angle of 45 degrees. The cosine of the angle is .70. Therefore, if the vertical steel is given a value of 10,000 pounds, the bent-up steel will have a value of 14,300 pounds. If one-half of the bent-up steel can be used to withstand horizontal shear, then the same area of bent-up steel as of vertical steel will have an actual value of 7,150 pounds, or approximately seven-tenths of its area is to be considered as resisting the stresses set up by the shear.

Between columns 13 and 14 the footing can be considered as semi-continuous. The actual moment will be the same as found above, but in order to reduce it to inch-pounds and to the proper moment for a semi-continuous beam it will be necessary to multiply the moment—2,451,300 foot-pounds—by 12 and by $\frac{4}{5}$. This will give a moment of 23,532,480 inch-pounds.

$$S = \frac{23{,}532{,}480 \times 8}{7 \times 47.5} = 566{,}000 \text{ pounds.}$$

$$\frac{566{,}000}{16{,}000} = 35.4 \text{ square inches.}$$

$$\frac{35.4}{1.56} = 23 - 1\tfrac{1}{4}\text{-inch square bars.}$$

Of the 23 bars necessary to withstand the tension in the upper part of the footing between columns 12 will be straight and 11 will be double bent. Under column 14 it will be necessary to add 3 straight bars, as there are 11 bent down at the right and 9 at the left, making a total of only 20, and the 3 additional bars will be required to give a total of 23.

As the stress in the steel has increased as the footing is regarded as a semi-continuous beam, in a like manner the compression in the concrete also increases. Assuming that the compression in concrete is equal to the stress in the steel it will be found that the concrete is overstressed 566,000 − 471,800 = 94,200 pounds. It will be necessary to add some bars at the bottom of the footing to withstand this compressive stress. These bars will be placed 4 inches above the bottom of the footing.

As stated in the last article, the allowable stress in the steel is found by the formula, $S_1 = n \times fc$. n will be taken as equalling 15, f will be considered as 650, and as three-eighths of 47.5 equals 17.8, the ratio c will equal 13.8 divided by 17.8. By substituting these values in the above equation the value of S_1 will be found to be 7,560 pounds per square inch. If it is necessary to supply steel to withstand a compressive stress of 94,200 pounds there will be required 12.3 square inches of steel and this can be provided if eight 1¼-inch square bars are placed in the bottom.

There is no particular problem encountered in the design of the stirrups except that in the present case there should be hoops provided in place of stirrups, as it will be necessary to tie in the steel at the bottom of the footing. The hoops will be made up as shown in the section in Fig. XIX.

It will be noticed that the end of the footing projects beyond column 13 and this acts as a cantilever. As the sections under the columns are considered as being 20 feet long, the end will project 10 feet beyond the centre line of the column, or will have a clear span of 8 feet 7 inches. The pressure of 7,320 pounds per square foot against this end will give an upward pressure of 429,300 pounds.

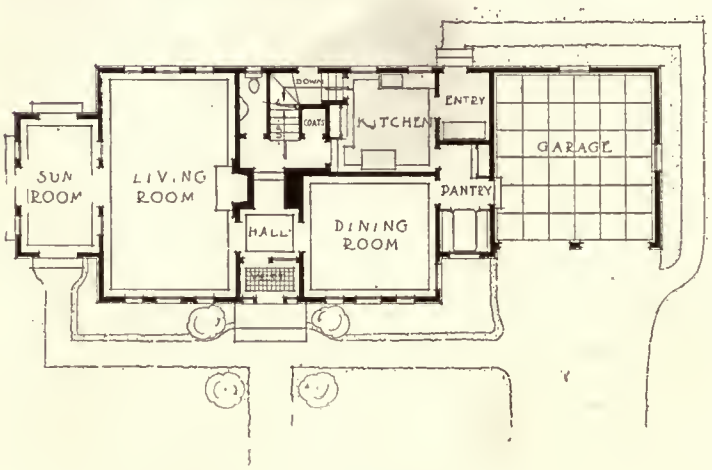
The moment of this around the edge of the column will be 429,300 × 4.29 = 1,841,000 foot-pounds, or 22,100,000 inch-pounds. By multiplying this by eight-sevenths and by dividing by the depth—47½ inches—the stress in the steel will be found. (22,100,000 × ⅞) ÷ 47.5 = 533,000 pounds. 533,000 ÷ 16,000 = 33.3 square inches of steel required. This area can be supplied by 21 bars, 1¼ inches square.

By referring to the plan and elevation in Fig. XVII it will be seen that the eight 1¼-inch square bars that are used to reinforce the bottom of the footing against compression in the concrete are run through to the end. It will also be seen that there are 11 double bent bars, making a total of 19 in all. To these it will be necessary to add two more to have the total of 21 as required.

The stress in the steel was found to be 533,000 pounds, and if a like stress is found in the concrete this will be overstressed 61,200 pounds. As the steel in compression is capable of withstanding a stress of 7,560 pounds per square inch, there will be 7 square inches of steel required, and this can be supplied by five 1¼-inch square bars.

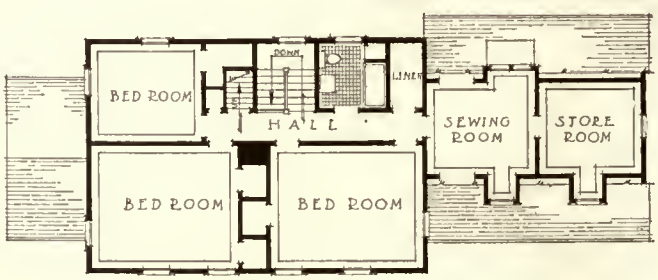
It will be noticed that there are a large number of stirrups at the end and that these are made of ⅝-inch round

rods. The reason for the need of the 12 large stirrups is that there is no bent-up steel in the end and it is necessary to take up all the horizontal tension by means of the stirrups. The rods have a cross sectional area of .3068 square inch, and as they are bent so that there are four vertical legs the area of steel per stirrup is 1.2272 square inches. The resistance to horizontal tension per stirrup is 19,630 pounds. There will be one-half the shear at the end, as was found between the columns, so there will be required 236,000 ÷ 19,630 = 12 stirrups.



FIRST FLOOR PLAN.

SCALE



SECOND FLOOR PLAN.

HOUSE AND PLANS, U. G. FREDERICK, AKRON, O. Albert Houghton Good, Architect.

The Housing Development at Olean, N. Y.

Alfred C. Bossom, Architect

THIS country owes an enormous debt of gratitude to General U. S. Grant. He reduced a great fundamental to a very few words when he stated that "The way to resume is to resume." He, of course, alluded to the gold currency, but every community has been in the same position of late regarding their housing condition. It has been impossible to go anywhere without hearing complaints regarding the unsatisfactory housing facilities existing, but very little has been done to overcome it in the majority of places. But Olean, New York, realized the need, retained an architect, and went ahead, and in doing so adopted an unusual procedure.

The Chamber of Commerce looked around and found out their townsmen and men with real practical horse-sense regarding buildings. Next, they all got together and mutually agreed that the benefit to themselves and to the town would be so great that each one who could supply any material toward the undertaking would do so at the very minimum of cost, and that they would build the houses themselves without any general contractor. The development of the town had set in in the past in a certain direction, and so just beyond this, and right along the line of the main thoroughfare a large tract of rolling land was selected and purchased without paying any extravagant prices.

The roads were laid out to fit the contours of the land, and houses were designed to fit the requirements of the people. In these houses the "handy-kitchen" is a great feature. Within this are built fitments which give the housewife every convenience ready to her hand. She has no avoidable steps, and there is a place for everything, and if she will only keep everything in its place she will have a new point of view regarding the pleasures of housekeeping. Another feature that is very conspicuous, as will be seen by the plans, is the combined living and dining room. In houses of this size this is the logical way of handling such a problem. How frequently do we go into houses that are built for housing where the room that was originally intended to be a living-room is used as a bedroom? Why not design it originally so that it will logically be a bedroom if required?

When the houses were first laid out many studies were made to see if they should be in concrete, stucco on terra-cotta, stucco on metal lath on a wooden frame, or typical balloon frames with shingle and clapboard exteriors. After figuring around all ways it was found that for speed of construction and economy the entire wood house would show the best results, and it seemed to combine in itself more of the desirable qualities needed by the people locally. Again, when this point was reached an effort was made to cut off every unnecessary cornice, all posts were simplified, and the beauty of nature was introduced by placing flower-boxes on conspicuous spots and trellis-work in others where it would get results at no expense. Houses of a similar nature to these are costing, and have cost, in the neighborhood of ten thousand dollars ($10,000) each when their general proportionate cost on the improved property is also considered, but in this case the average cost does not exceed five thousand dollars ($5,000), and when this is realized in relation to all of the outcry that has gone up as regards the high cost of building, it demonstrates that if the matter is carried forward on logical lines, with profiteers excluded, and an honest day's work done for an honest day's pay, it is possible and practicable to go right ahead and build buildings at a proper price.

The type of houses consists of five-room double houses, six rooms and seven rooms, varied in many ways so as to make innumerable types. The entrances are always located in a manner giving a closet to hang a coat in right away. The living-rooms are big, commodious rooms, and the staircases are arranged with the object of not making them expensive constructions.

Again, every house is laid out to be heated by a "pipeless heater," which, of course, does put a certain limitation upon the arrangement, but if it is handled with care it can be a beneficial limitation, and not otherwise. All the lumber is supplied by townspeople at a most attractive price, and in fact the hardware, the plumbing fixtures, electric fixtures, all have been provided on the theory that the benefit from the improvement to the community will be a part of the return that each contributor will derive.

Olean has set the country an example from which much can be learned, and the type of houses produced, many of which are now finished and ready for habitation, stands as a very fine monument of what can be done where there is the spirit to do it.

A "Dutch City" at Lens

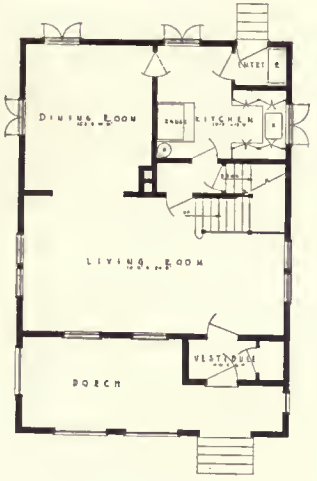
FRANCE is indebted to Holland for a very present help in time of need. At the conclusion of the armistice she offered the French Government necessary materials for the construction of more than five hundred houses, paying all transportation costs and supplying Dutch architects and builders to direct the work. The result is what is now known as the "Dutch City" on the Lille road at Lens.

Each house is surrounded by a little garden, and schools, hotel, public baths, and shops have been constructed. Not only are the brightly painted houses all finished, but they are already inhabited by some two thousand persons; the shops are well stocked, the children are attending the three schools, workers passing through the city are received at the hotel, and the public hall is often the scene of cheery gatherings.

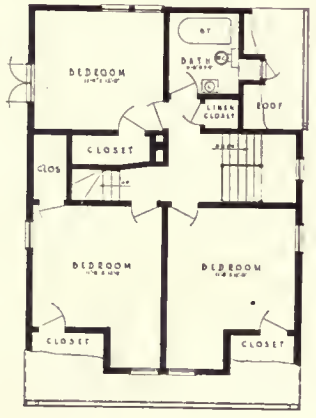
At Lievin, near Lens, a second and smaller Dutch city is in course of construction.

The architecture of Holland, as our readers know, is picturesque in its general lines, and the use of color adds a lively and individual character. As a matter of fact there are many houses in northern France that plainly show the Dutch and Flemish tradition. Holland has always known the decorative value of brick, and the charm of many quaint buildings along Dutch and Belgian canals is largely due to the patterns in brick that relieve what otherwise would have been but dull and barren façades.

SENECA HEIGHTS.
HOUSING PROJECT
OLEAN, N. Y.
ALFRED C. BOSSOM, ARCHITECT
680 FIFTH AVE NYC



FIRST FLOOR PLAN

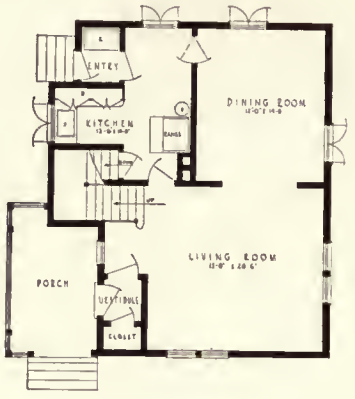


SECOND FLOOR PLAN

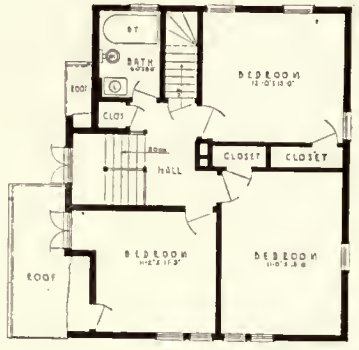
Alfred C. Bossom Architect N.Y.C. SIX ROOM TYPE (A)

SENECA HEIGHTS HOUSING PROJECT, OLEAN, N. Y.

SIX ROOM TYPE (B)



FIRST FLOOR PLAN.



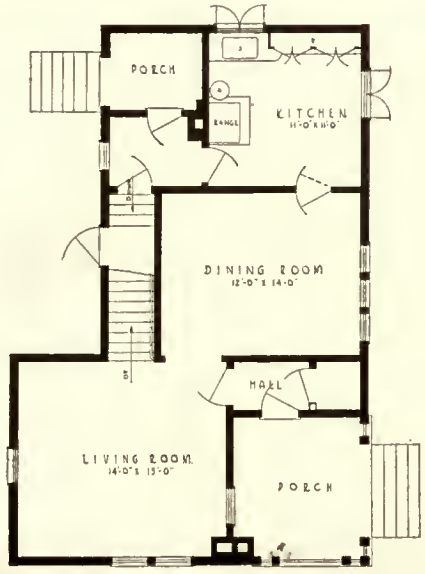
SECOND FLOOR PLAN

Alfred C. Bossom Architect N.Y.C. SIX ROOM TYPE (B)

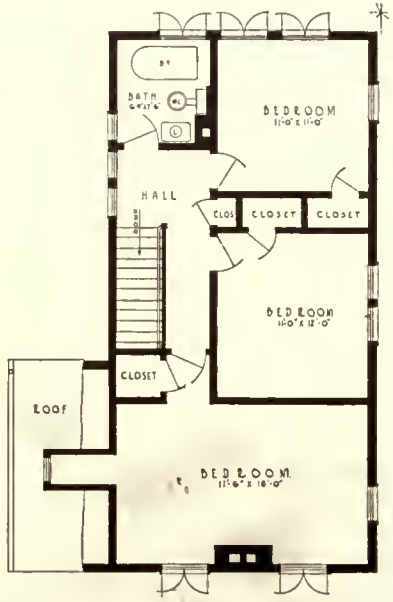
Alfred C. Bossom, Architect.

SIX ROOM TYPE 'E'

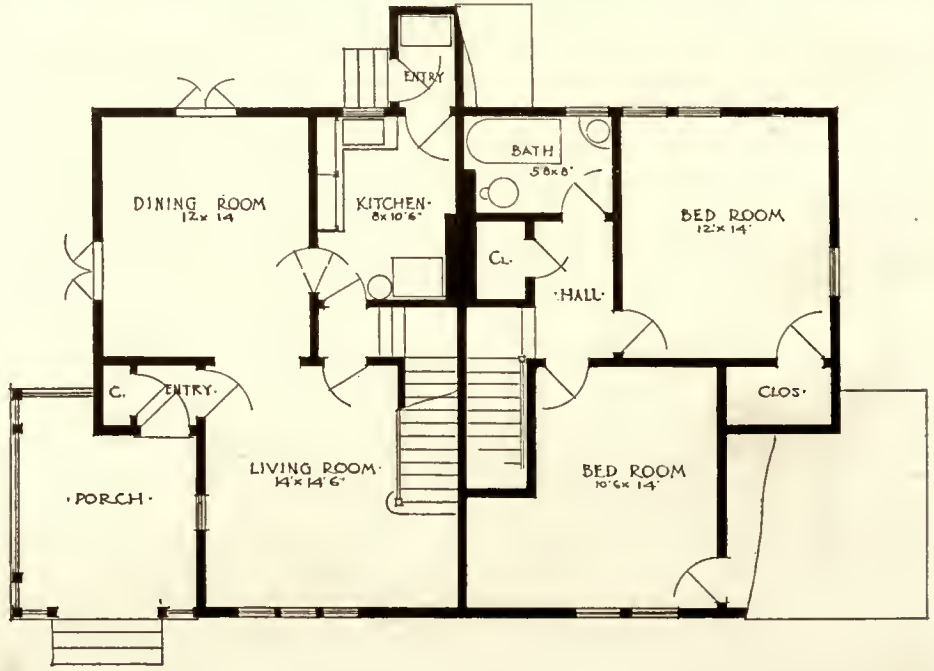
FIVE ROOM DOUBLE TYPE 'K'



FIRST FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR SECOND FLOOR

Alfred C. Bossom Architect N.Y.C. SIX ROOM TYPE (E)

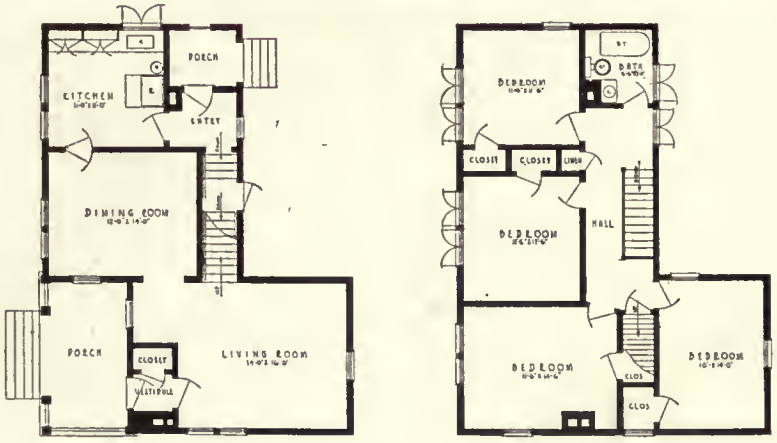
SENECA HEIGHTS HOUSING PROJECT, OLEAN, N. Y.

FIVE ROOM DOUBLE TYPE K

Alfred C. Bossom Architect.

Alfred C. Bossom, Arehitect.

SEVEN ROOM TYPE 'M'

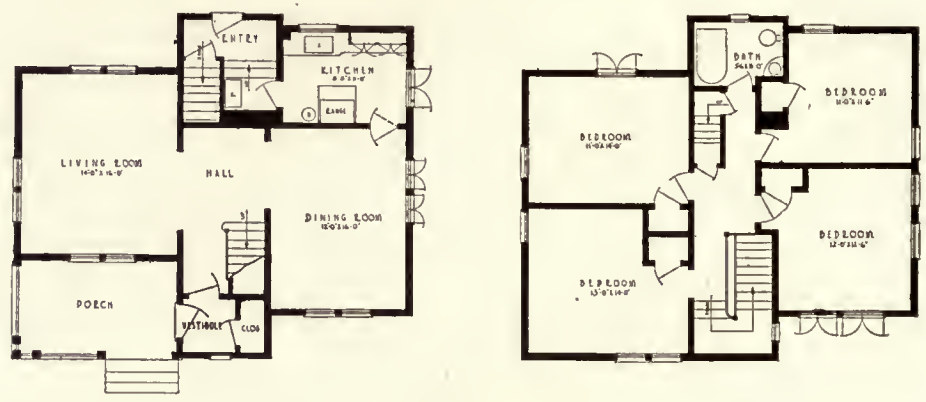


FIRST FLOOR PLAN SECOND FLOOR PLAN

Alfred C. Bossom Architect N.Y.C. SEVEN ROOM TYPE (M)

SENECA HEIGHTS HOUSING PROJECT, OLEAN, N. Y.

SEVEN ROOM TYPE 'N'



FIRST FLOOR PLAN SECOND FLOOR PLAN.

Alfred C. Bossom Architect NYC SEVEN ROOM TYPE N

Alfred C. Bossom, Architect.

Construction of the Small House

By H. Vandervoort Walsh
Instructor, School of Architecture, Columbia University

ARTICLE XII

CONSTRUCTION OF THE TRIM

This is what the speculative builder spends money on

THE wood trim, the doors and windows, and the built-in furniture of the small house can make or mar its appearance more than any other one factor. Indeed, in no other form of architecture is the study of these details more important, and yet in no other type of building is the limitation of cost more exactingly imposed upon the architectural treatment of the trim.

By the very economy demanded in the small house, the architect must make the mouldings of his casing in the simplest possible forms. The trim around doors and windows on the exterior and interior can boast of no special mouldings. In fact the selection must be made from stock material or else the cost will be too great. Most planing mills have standard types of trim, but generally they are very badly designed. However, one cannot go wrong in using a plain board casing ¾ inch by 3⅝ inches, which has slightly rounded corners. The tops of doors and windows which have this simple casing should be capped with a fillet 7/16 inch, a head casing ¾ inch by 5 inches, and a cap mould 1⅛ inches by 2 inches. This eliminates the mitred corner, which is of such doubtful value in cheap work, since most wood trim is not properly seasoned and will quickly open all mitred joints.

To match this simple trim the window apron should be a plain board ¾ inch by 3⅝ inches, and the stool 1⅛ inches by 3⅝ inches. A plinth block at the base of the door trim in size 1⅛ inches by 3¾ inches by 7¼ inches will match up with a plain baseboard, ¾ inch by 7¼ inches, or one of similar size, with a cyma recta moulding on top.

If the local mill from which the trim is purchased has stock mouldings of pleasing design, the architect may safely specify them, but he should not make the economic mistake of demanding specially designed casing from full-size details of his own. The small house cannot stand this additional cost.

In selecting the trim, it is always important to bear in mind that it must harmonize with the walls and have no obtrusive appearance, since with the walls it affords a background for the furniture. In Colonial work the painting of the trim white, pearl-gray, or cream is always the most pleasing, and so the architect should select a wood which will best take the paint. White wood and white pine are ideal for this purpose. Gum wood is good, but there is always the chance that it will not hold its place and twist. Yellow pine is difficult to paint well, since the hard summer wood has a tendency to stand out beyond the softer spring wood, making the surface irregular; but this difficulty can be overcome if a number of priming coats are used to fill in the grain before the enamel is applied. But the architect should not make the mistake of finishing the painted trim with a glossy enamel, for this will destroy all the quietness and background effect of it. A matt surface of paint or an egg-shell enamel finish should be used.

This same principle should be followed in selecting and treating the hardwood casing which is not to be painted. The trim should never be finished with a bright, glossy varnish and stain, for nothing is more ugly in its final effect. Treat the hardwood trim, such as oak, chestnut, ash, and the like, with an oil stain; rub in a filler, stained slightly darker, and then shellac. Over this apply a wax finish, and rub this down with a shoe brush. Varnish manufacturers make grades of varnish which give the dull effect of wax, and these can be used, if desired; but why? Many prefer to even omit the shellac and depend entirely upon the wax for the gloss.

When trim is delivered to the job, it should not be stored in a damp place nor fitted in place before the plaster is entirely dry. In fact, in order to protect the trim from losing its shape, as soon as it comes on the job a priming coat, or filler, should be applied to it, and the ends and back painted with white-lead and oil. It will be noticed that all well-designed trim has a gouged-out space at the back to permit circulation of air around it, and also to make it easier to fit against a flat surface of plaster.

Mouldings for the trim of exterior cornices, string courses, and the like are often specially designed by architects for the small house, but it is a much better plan to use stock mouldings, selecting them to approximate the design that is desired. Through the efforts of many concerns the market affords many well-designed stock patterns of mouldings for exterior purposes. The idea is sound, and makes possible a great variety of designs through the standardization of parts, and at the same time cutting down the cost.

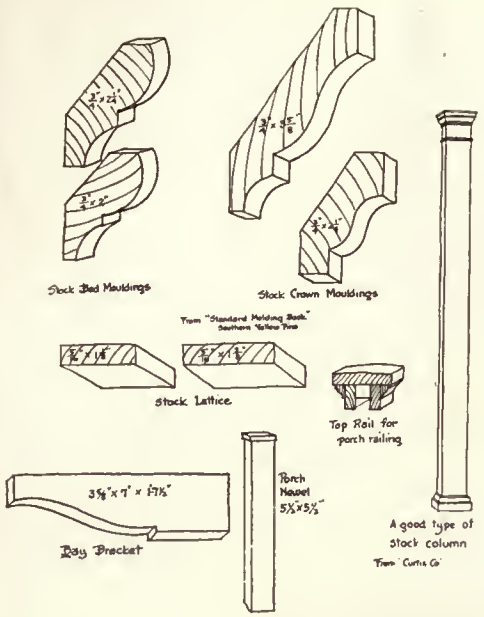
Likewise the standardization of doors and windows is another economic aid for the small house.

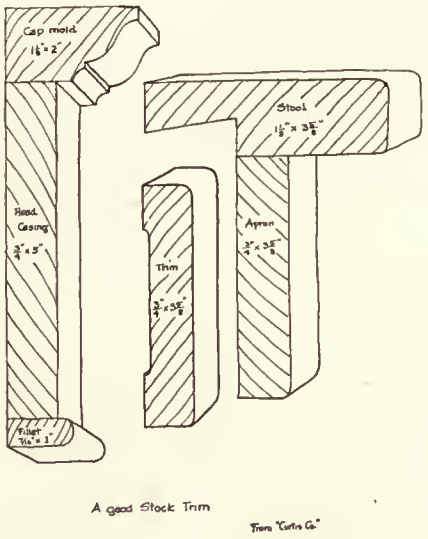
As a rule, all exterior doors should be at least 1¾ inches thick, and of white pine, painted. The veneered door is not a very satisfactory type for outside use, unless, perhaps, it is protected by the porch, for even with the best waterproof glue there is a considerable tendency on the part of the veneer to break away from the soft pine core. Some consider that the 1⅜-inch thick door is satisfactory for exterior doors in the small house, but, generally speaking, it is best to use this thickness only for interior doors.

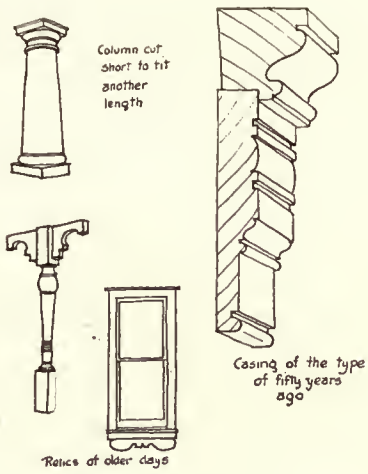
Softwood doors, 1¾ inches thick, have panels; if they are raised, only 1⅛ inches thick; while doors 1⅜ inches thick have raised panels only 9/16 inch thick, and flat panels 5/16 inch thick. The latter is quite evidently too thin for exterior doors.

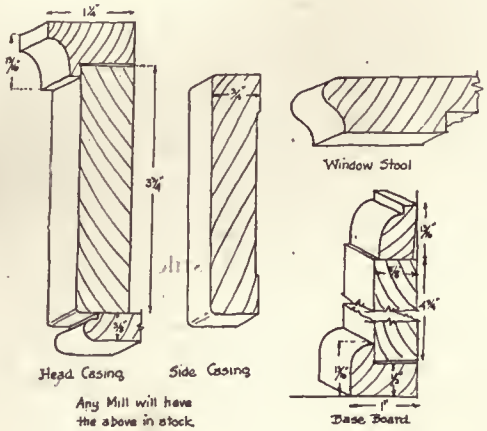
Interior doors of veneered woods usually have flat panels, 5/16 inch thick, except the one panel door, which is as

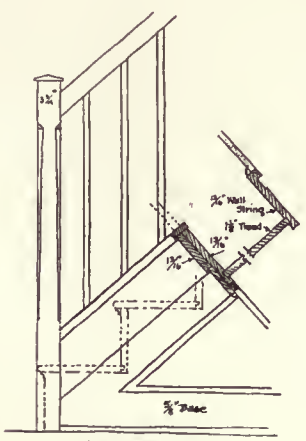
(*Continued on page 256.*)

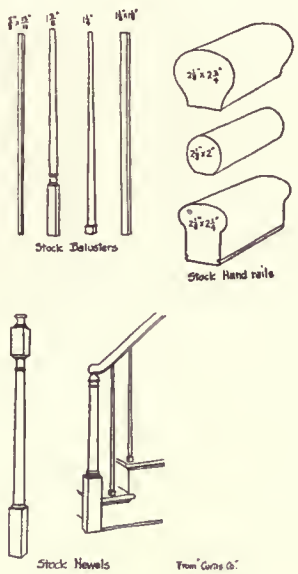

Stock Bed Mouldings
Stock Crown Mouldings
From "Standard Molding Book" Southern Yellow Pine
Stock Lattice
Top Rail for porch railing
Bay Bracket
Porch Newel
A good type of stock column
From Curtis Co

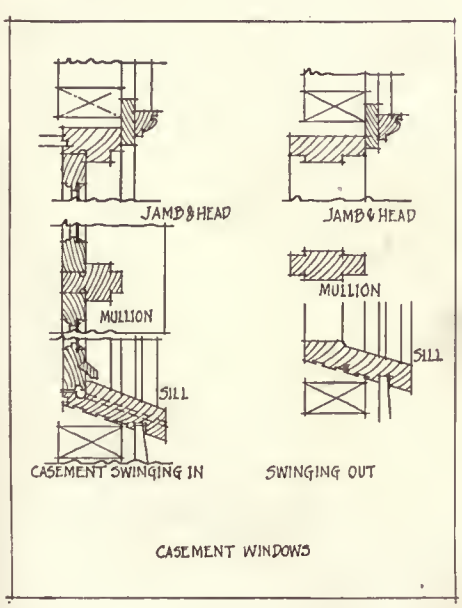

Cap mold
Stool
Head Casing
Apron
Trim
Fillet
A good Stock Trim
From "Curtis Co"

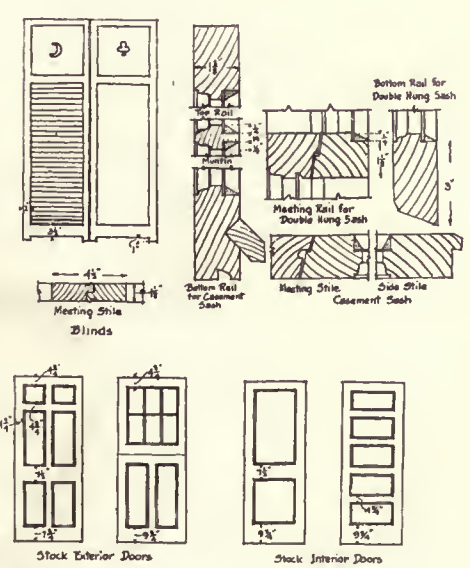

Column cut short to fit another length
Casing of the type of fifty years ago
Relics of older days
The kind of stock trim which some mills continue to keep on hand

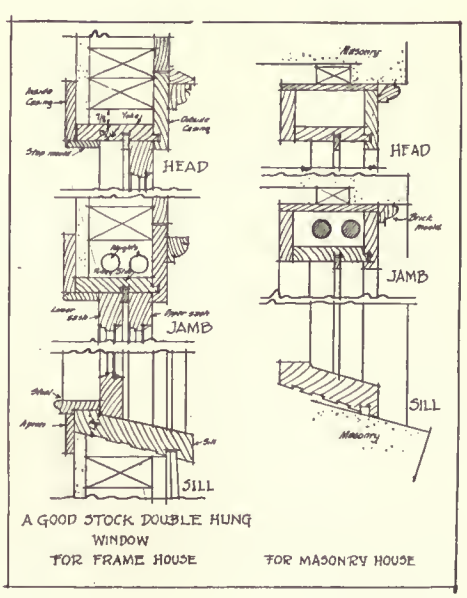

Window Stool
Head Casing
Side Casing
Any Mill will have the above in stock
Base Board


Simple Stair Detail from Stock Material of any Mill


Stock Balusters
Stock Hand rails
Stock Newels
From Curtis Co


JAMB & HEAD
JAMB & HEAD
MULLION
MULLION
SILL
SILL
CASEMENT SWINGING IN
SWINGING OUT
CASEMENT WINDOWS


Meeting Stile
Blinds
Top Rail
Muntin
Bottom Rail for Casement Sash
Meeting Rail for Double Hung Sash
Bottom Rail for Double Hung Sash
Meeting Stile
Side Stile
Casement Sash
Stock Exterior Doors
Stock Interior Doors


HEAD
JAMB
SILL
HEAD
JAMB
SILL
A GOOD STOCK DOUBLE HUNG WINDOW
FOR FRAME HOUSE
FOR MASONRY HOUSE

(*Continued from page 254.*)

thick as 7/16 inch. Such panels consist of three layers, the two outside veneers and the interior softwood core with the grain running at right angles to the veneer. The stiles and rails of well-built veneered doors are made of built-up pine blocks, glued and locked together, with a tongue and groove joint, and fastened at the corners with hardwood dowels. Strips of hardwood to match the veneered face should be placed on each edge of the stiles and rails.

The common stock sizes of doors are as follows:

2 feet by 6 feet
2 feet by 6 feet 6 inches
2 feet by 6 feet 8 inches
2 feet 4 inches by 6 feet 6 inches
2 feet 4 inches by 6 feet 8 inches
2 feet 6 inches by 6 feet 6 inches
2 feet 6 inches by 6 feet 8 inches
2 feet 6 inches by 7 feet
3 feet by 6 feet 8 inches
2 feet 8 inches by 7 feet
3 feet by 6 feet 8 inches
3 feet by 7 feet

The commonest type of window for the small house is equipped with the double-hung sash. This sash should be made of 1⅜-inch white pine, mortised and tenoned at the corners. The meeting rail ought to be rabbeted so that water is prevented from seeping through, and the bottom rail ought also to be rabbeted to fit over a similar rabet in the sill. The size of the lower rail is usually 3 inches wide, the sides and top rails 2 inches wide, and the meeting rail 1⅜ inches wide. It is generally admitted that a window has little architectural charm without muntins, and these are made ¾ inch wide, as a rule. The glass of the window is inserted into the sash frame at least ¼ inch, and its plane is about one-third in from the outside face of the rails. The overall dimensions of a window sash are determined by the size glass used, and as glass is cut in inches, the overall dimensions of a sash will be in fractions of inches. For example, a double-hung sash of twelve lights, each 8 inches by 10 inches, will give a sash opening of 2 feet 4½ inches by 3 feet. If the lights measure 9 inches by 12 inches, then the sash size will be 2 feet 7½ inches by 4 feet 6 inches.

The best type of double-hung window-frame is constructed so that the blind stop is rabbeted to receive the pulley stile, preventing any wind from blowing through. The pulley stiles are usually made of yellow pine, but the outside casing and sills should be of white pine. It is also a good precaution to have the sill rabbeted to receive the ground strip, so that air cannot come underneath the sill. The use of 1⅜16 inch thick material is common for all parts of the frame except the sill, which ought to be 1¾ inches thick. A 2¼-inch depth should be allowed for the weights in the box, and a space of ⅞ inch left between the stud and the top of the frame. Parting strips are made ⅜ inch wide.

Where the frame is to be built into a masonry wall, the back of the weight box is closed in, and a moulding, called the brick mould, should be provided for covering the outside joint between frame and masonry. In order to make this joint tight in hollow-tile construction, it is essential to stuff the back of the brick mould with elastic roofing cement.

There is not much reason to rehearse here the pros and cons of the casement window. When such windows open in, the screens and blinds are easier to handle, but the weather is apt to leak in more. When the sash opens out, screening is difficult, unless some patent operating hardware is used, but the window is more weather-proof. In either case, the difficulty of weathering can be overcome to a large extent by not attempting to keep out the rain, but lead it down and around the sides, draining it off at the sill. This is accomplished by cutting a ¼-inch half-round groove around the sides and in the sill to act as a canal for collecting the water which has seeped in. A few ¼-inch round weep holes from the groove in this sill outward will drain this collection of water off. Casement frames are made of heavier material than those used for double-hung sash, 1¾ inches being common. As the sash is hung from the sides like a door, its weight must not be so great that it will cause it to sag, and for this reason it is customary to limit the width of sash to 2 feet maximum. Some designers believe that the sash should also be at least 1¾ inches thick.

Although blinds add to the cost of the small house without apparently adding practical value, yet they are one of the most useful mediums of securing variation of color on the elevations. In colonial days shutters served to protect the house, and were made solid with only a small hole in them, generally of some ornate cut-out design, like a half-moon, flower-pot, etc. To-day we want slats for ventilation. A good compromise, then, is to make the lower part of slats and the upper part solid, with a cut-out design. The stiles and rails of the shutter are made of 1⅛-inch material, the bottom rail being 3½ inches wide, the stiles and top rails 2 inches wide. Intermediate rails are often made 2½ inches wide. It is best to project the stile 1 inch below the bottom of the lower rail, so that water collecting on the sill can drain off underneath the blind.

In addition to the blinds, the window should be equipped with screens. These should be of copper, for only this material is economical in the long run. They are usually made of ¾-inch material, and the lower rail, stiles, and top rail made 1¾ inches wide.

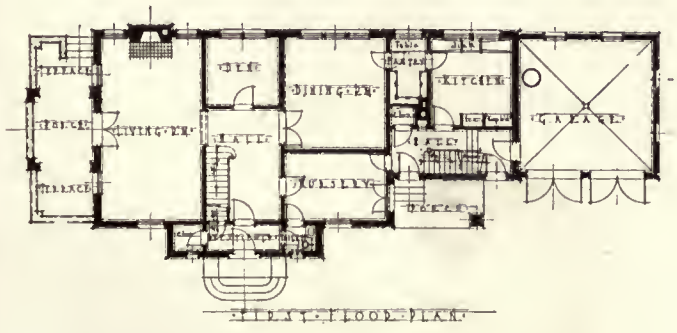
Other mill work of the exterior, such as porch columns, rails, etc., ought to be built up from stock mouldings and patterns. There are numerous concerns selling well-designed wooden columns. The great danger of using stock columns, however, is in the fitting. Certain stock lengths are made with well-planned entasis, but if the design calls for an intermediate length the column is cut short, which destroys its proportions. On this basis, many select square columns, or thin wooden columns without much entasis. The illustrations show some common stock sizes for other outside trim such as lattice, top rails, bottom rails, balusters, etc.

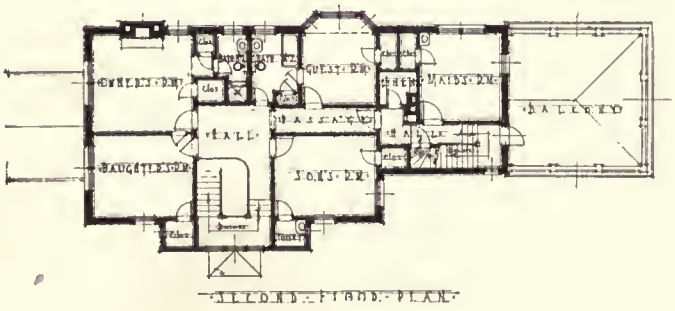
Of the interior mill work the stairs are the most important. For the small house they should be very simple, not only for economy but for appearance. Plain round and square balusters, 1⅜16 inches, and two to a tread, simple hand-rail and simple newel post, 3¾ inches, are more effective than elaborately turned members. The height of the hand-rail from the top of the tread to the hand-rail on a line with the face of the riser should be 2 feet 6 inches. The slope of the stairs should preferably be confined between 30 degrees and 35 degrees, and the common proportion between tread and riser should be maintained (tread and riser = 17½ inches).

The treads should be of 1⅛-inch hardwood, and the risers of 1⅜16 inch softwood, rabbeted into the riser. Outside strings ought to be ⅝ inch thick where finishing on a ⅝-inch base. Inside strings should be 1⅜16 inches thick. Enclosed stairs between walls should have strings fitted down on treads and risers; but elsewhere inside strings should be rabbeted for treads and risers. Newels should be housed out over supports.

A feature of the small house which is neglected too

much is the installation of built-in furniture. There is a substantial quality about such furniture which no mobile furniture can possess. The bookcase built into the wall, the window-seat permanently a part of the room, a charming mantel-piece, good panelling, built-in china-closets, tables and benches in the breakfast alcove, a modern kitchen dresser with the equipment of a portable cabinet, dressing-tables and closet shelves and drawers, medicine-cases and radiator enclosures are features which add so much to the small house that it seems strange that they are so often omitted. Many a speculative builder has realized the value of such furniture and sold his house upon the attractiveness of it. He knows that the young couple who purchases the small house usually comes from the small apartment, and has little furniture to spare. Here then is a place to spend money and not to economize.





HOUSE AND PLANS, WILL H. WADE, INDIANAPOLIS, IND. Bass, Knowlton & Graham, Architects.

The High Price of Gothic

By G. E. Mathews

Head of Architectural Department of Hoggson Brothers, New York

IN view of the fact that a number of office-buildings and other business buildings have been recently designed in Gothic style, and that the adaptation of this style to certain of these buildings has produced a result which has received the highest commendation not only from the public but from architectural critics, the question often arises why this style is not more generally used for banking work, instead of the more familiar classic design.

There is no question but that a beautiful and thoroughly satisfactory building can be produced in Gothic, providing it is designed by an architect who is particularly trained in that style and sufficiently familiar with the characteristic details to be used. This is, of course, true in either the classic or Gothic styles, but it works peculiarly to the disadvantage of the Gothic, because a very small percentage of the work now done is Gothic. Comparatively few architects use it for their buildings, and consequently few workmen become familiar with its detail.

This operates to both lessen the chance of a satisfactory result in design and also to increase the cost of the building. At the same time unless the architect is able to incorporate some particularly striking effect which will at once mark the building as a bank, the general effect and the impression on the public will be that of a church, because Gothic design is now associated with religious or educational buildings, while the classic styles are associated with business and civic buildings.

In all successful buildings the use of the building and its architecture should be in absolute harmony. This is strikingly shown in the Woolworth Tower, where the Gothic spirit and detail has been admirably incorporated into a sky-scraper. Modern banking practice, however, requires light and spacious business rooms, which leads to the use of classic design with its large window openings and wide spaces rather than the pointed windows, heavy piers, and vaulted ceilings which are associated with Gothic design. As a consequence, should the bank architect attempt to use the Gothic style in the construction of his buildings, it would probably result not in a Gothic building at all but in Gothic details applied to a building constructed along classic lines.

One must recognize that an architect who thinks in Gothic, having at his disposal plenty of money and time and skilled workmen (for all three would be necessary), could produce a most striking and successful bank building. Yet under modern conditions the classic style seems to be the most satisfactory. As a matter of fact, that such a beautiful style as the Gothic is neglected proves either that we do not know how to use it, or that it is not a style adapted to our times, except chiefly for the design of educational and religious edifices.

Announcements

COMPETITION IN MURAL PAINTING.—The Art Institute, of Chicago, announces that the *Chicago Tribune* has offered to the Institute School a competitive prize which is regarded as one of the greatest and most important ever offered in an art contest in America.

In seeking for the best possible decoration for the "local" room, the largest in the new Tribune plant on North Michigan Boulevard, Chicago, the paper evolved the plan of securing its design through the school of the Art Institute. In accordance with this idea the *Tribune* offers, in open competition, to all students in the Art Institute School, a prize of $5,000 for the best and most acceptable mural decoration for this room. Full details of the contest will be announced in good time for all prospective competitors. Students entering school in September, 1921, will be eligible as contestants.

Mr. Kuehn, who has been practising architecture for the last twelve years in Huron, S. D., has established a partnership with Mr. Earl Walsh.

Mr. Walsh has been with Mr. Kuehn for the past two seasons as draftsman, and this year completed a course in architectural engineering in the University of Illinois.

The firm hereafter will be known as Kuehn & Walsh, Architects and Engineers, with offices in Rooms 7 and 8, City National Bank Building, Huron, S. D.

Mr. Sidney H. Minchin has severed his connections with the firm of Minchin & Weller, Inc., formerly located at Marquette Building, Chicago, and has joined Mr. Alexander H. Spitz. Both architects are to continue the practice of their profession under the firm name of Minchin, Spitz & Co., Architects and Engineers, at their new location on the second floor of the Sears Building, 19 West Jackson Boulevard, Chicago, Ill. Mr. Paul L. Francescon will be associated with the firm.

Mr. Alexander H. Spitz, architect and engineer, announces his removal from 105 West Monroe Street to 19 West Jackson Boulevard.

Edwin F. Simpson announces that Rolland L. Githens has withdrawn from the firm of Simpson & Githens, and that he will continue the practice under the name of Edwin F. Simpson, Architect, with offices at 869 Reibold Building, Dayton, Ohio.

Willard C. Brinton, president of the Terminal Engineering Company, Inc., manufacturers of the Tec Truck and varied material handling machinery, makes the following announcements:

J. F. McGonigal, mechanical engineer, formerly of the Foamite Company, and J. H. Potter, mechanical engineer, a graduate of New York University, have joined the organization.

M. E. Lyle, for many years with the Columbia Graphophone Company, has been elected a vice-president, and is directly responsible for new business.

M. E. Peck has been elected secretary and asisstant treasurer.

Book Review

ITALIAN RENAISSANCE FURNITURE. By WILLIAM VON BODE. Translated by Mary E. Herrick. With 134 illustrations. William Helburn, Inc., New York.

The very wide interest always manifested in Italian Renaissance furniture and the comparatively few books existing on the subject makes Miss Herrick's translation of Doctor Bode's book a timely addition to this literature.

The text and the illustrations of the book have been arranged with reference to periods and schools. The plates enable one to trace both local differences and general underlying similarity. For instance, the reader may examine Tuscan types in one place, Ligurian in another, and Umbrian in a third division, and so on throughout the entire book. This arrangement is convenient for comparison and analysis, and will be found one of its most valuable features.

The subject is comprehensively treated by Doctor Bode, and the many illustrations will be found especially helpful for the student and the amateur, and should prove interesting to furniture manufacturers, architects, and decorators.

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ARCHITECTVRE

·THE· PROFESSIONAL · ARCHITECTVRAL · MONTHLY·

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As a recent installation we are pleased to present on this page a view of the handsome new passenger terminal just completed by the Missouri Pacific Railroad at Little Rock, Arkansas. Specially designed fixtures are used in the general and colored waiting-room, rest-rooms and ticket-office and in the smoking-room and lunch-rooms, giving a balance of taste and utility that is wonderfully pleasing and harmonious.

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Warren & Wetmore, Architects.

THE HECKSCHER BUILDING, FIFTH AVENUE AND 57TH STREET, NEW YORK.

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLIV SEPTEMBER, 1921 NO. 3

The Village Church of Pargny-Filain, Department de l'Aisne, France

By H. Cunningham, Architect

With Drawings by the Author

IN accordance with the laws that have been made (and remade) for this very special case of the Reconstruction of the Devastated Regions in France, the architect has the following problems to solve:

1. GENERAL OUTLINE OF THE RECONSTRUCTION PROBLEM IN FRANCE

a. Every construction of whatever nature, that existed before the war, must be measured (if any traces exist).

b. A schematic plan, section, and elevation must be drawn.

c. An estimate of the value (1914) must be made.

d. An estimate of the cost of reconstruction (1920–21) must be made. This latter is based on the 1914 value multiplied by the coefficient for to-day, which varies from 3 to 7, according to the branch of the work and the region.

In the case of *a*, where the foundations exist still, it is comparatively easy to measure them sufficiently accurately and to establish thereon (with the aid of indications given by the proprietor) the condition of the property before the war. Where the foundations do not any longer exist, it is quite another problem. Sometimes one finds the plans, sections, and façades in the files of the insurance company, sometimes in the files of the local notary-public (in the event that he had time to get out with his files before the Boche got in with his burning habits).

In the cases of *b*, *c*, and *d*, the matter of plans, estimates, etc., for ordinary buildings is reduced to a sort of system.

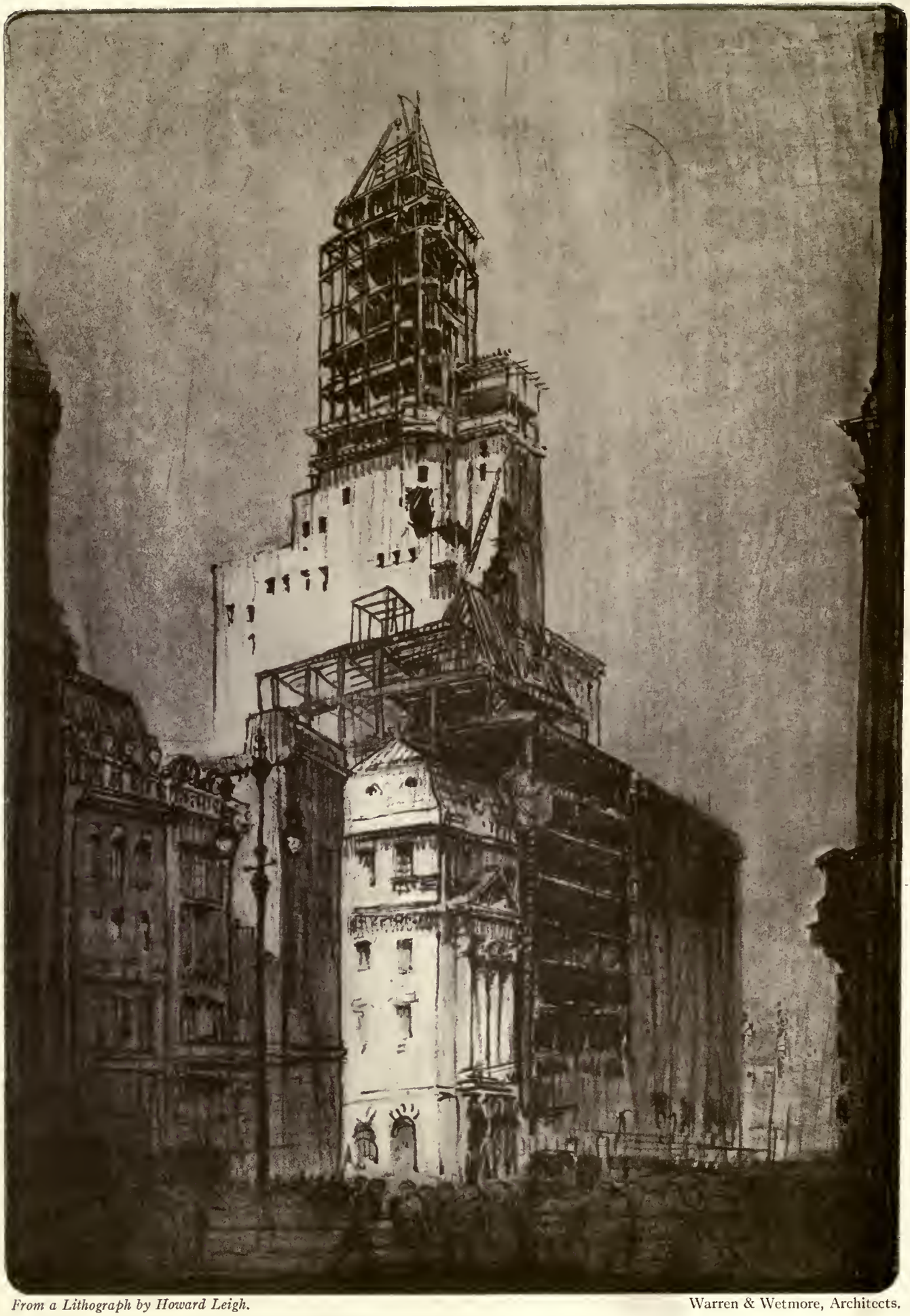
In the case of the churches, the architect is required to "dress" his plans and estimates much more in detail than for ordinary buildings. This because of the fact that there was carving (often very lovely), furniture of very special sort, wood panelling sometimes, ornaments of all sorts, etc. In order to complete his work the architect is often forced to find out some one—the priest, the sexton, a "chantre," and so on—who knew his church well, and can describe the condition of the furnishings, and so on, of pre-war days.

In the writer's mind there is nothing more charming in the realm of architecture than the village churches of France (excepting, perhaps, the village churches of England, and that is "encore très discutable").

In the special case herewith presented, the foundations exist still *in part*—two photographs, an exterior and an interior, were found—and an "ex-chantre" was able to supply—with that native natural knowledge of architecture which comes of *living with it* and which one finds among French peasants everywhere—the details which lacked. Thus the restoration of the village church of Pargny-Filain herewith presented is accurate in detail, and absolutely so in principle.

The little village of Pargny-Filain is half-way down in the valley on the "other side" of the Chemin des Dames.

(*Continued on page 262.*)



From a Lithograph by Howard Leigh. Warren & Wetmore, Architects.

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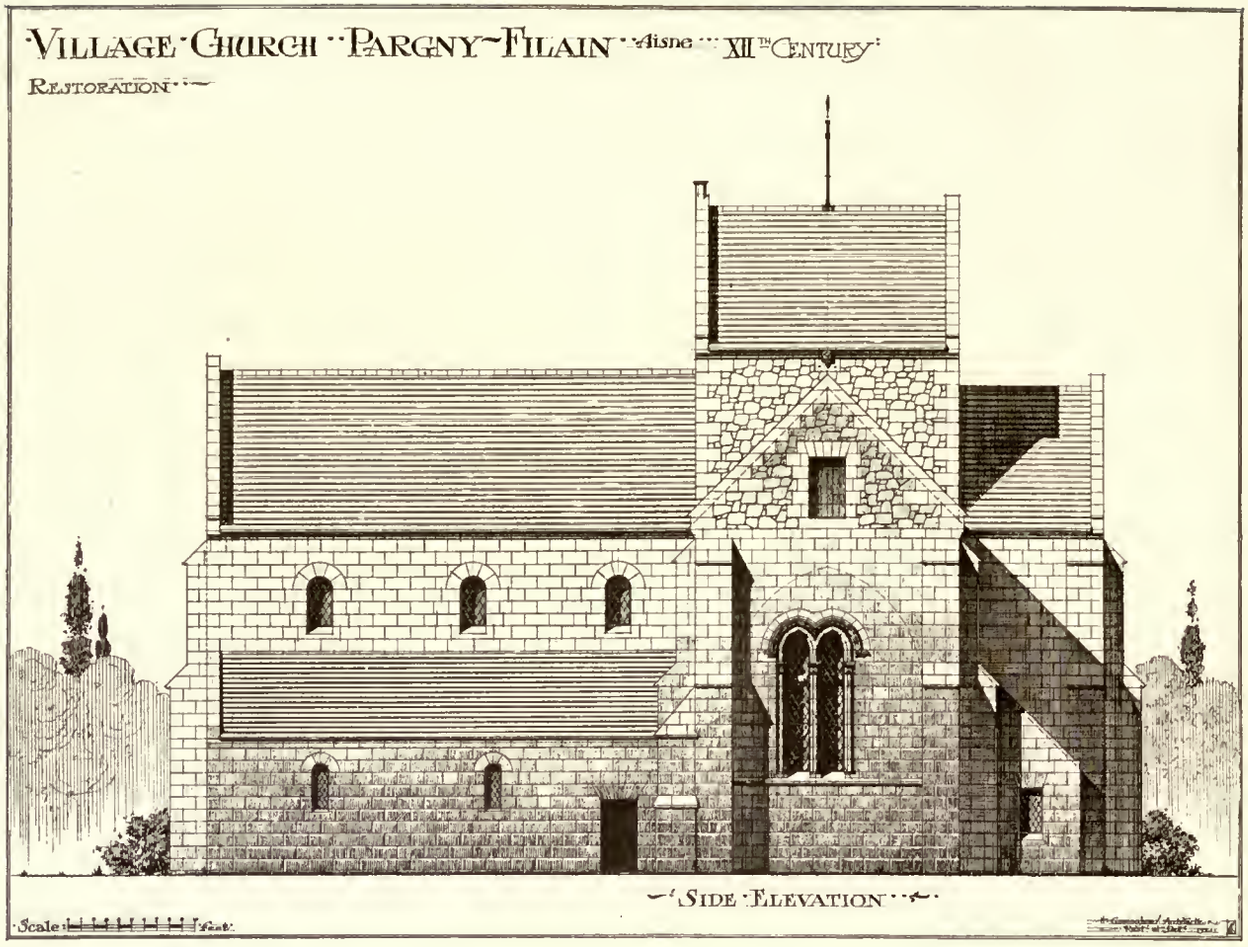
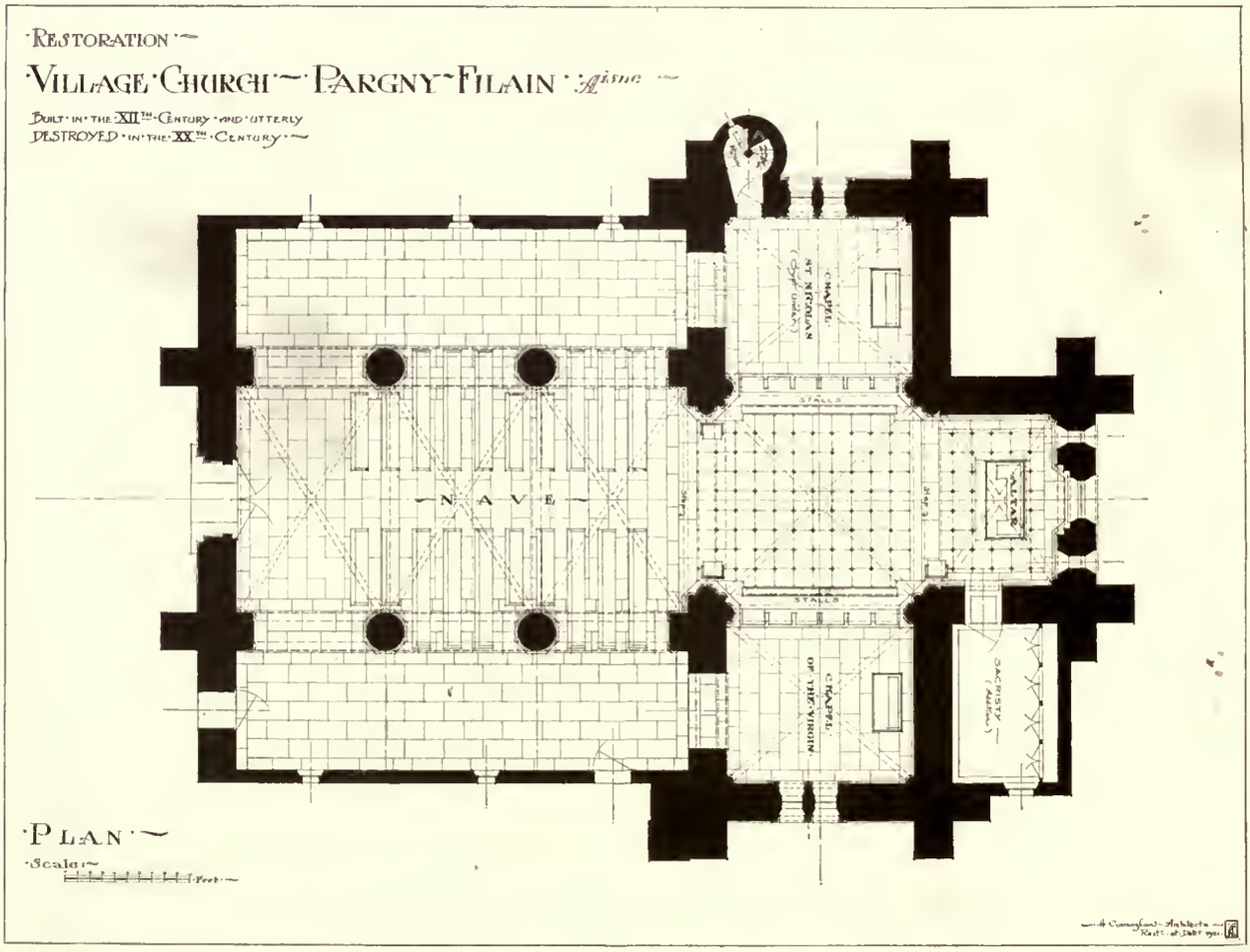
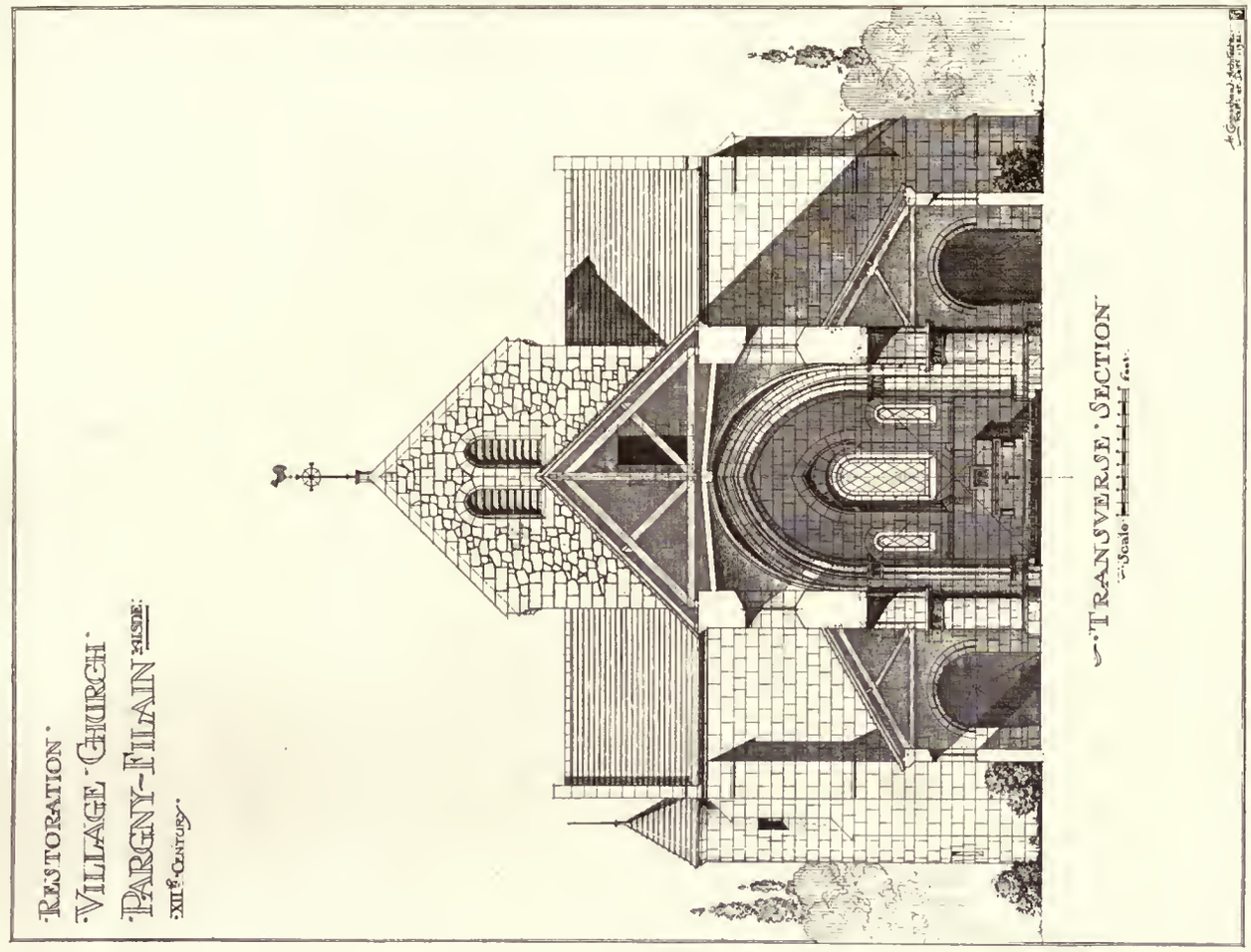
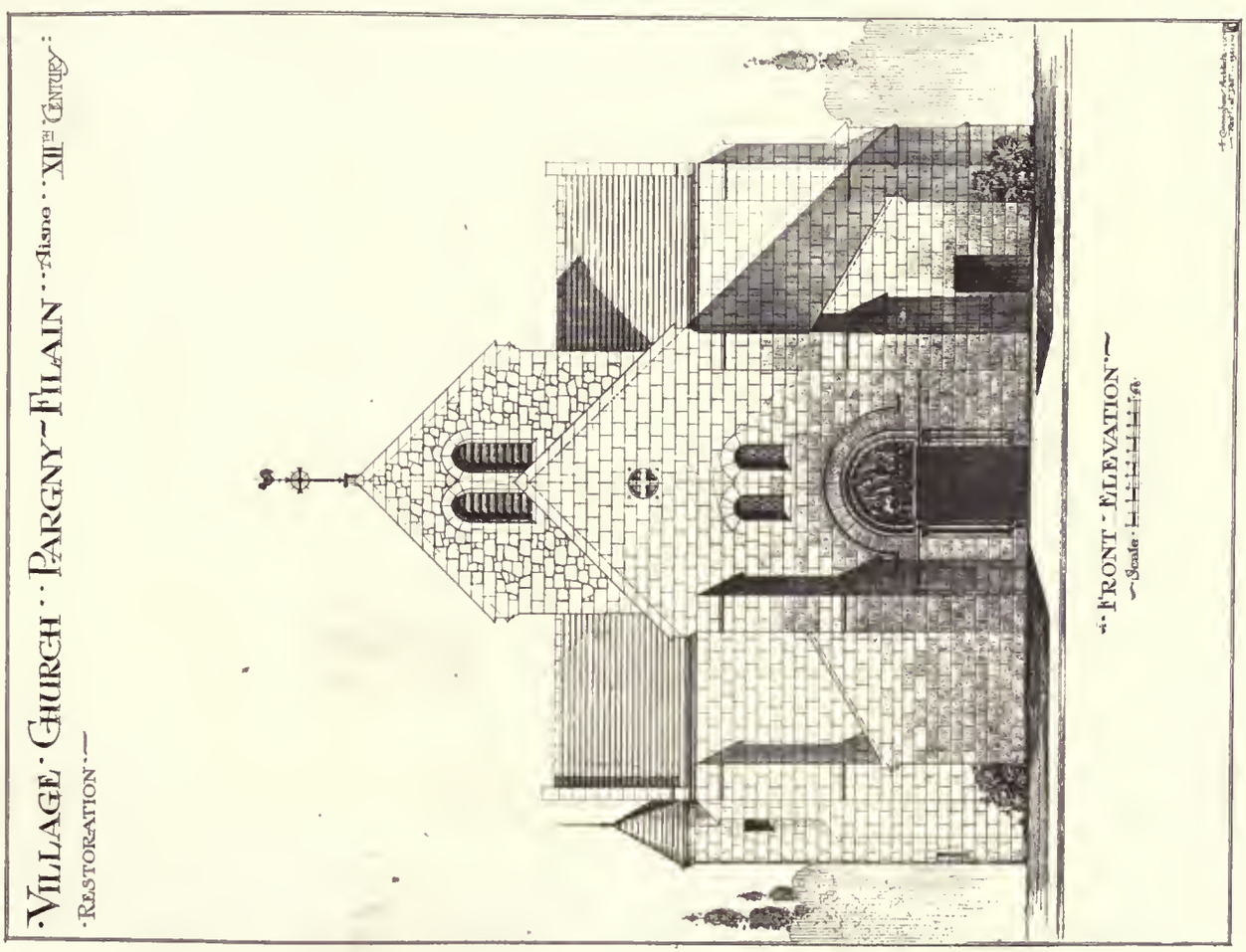
(*Continued on page 262.*)


VILLAGE CHURCH PARGNY-FILAIN Aisne XIITH CENTURY
RESTORATION
SIDE ELEVATION
Scale


RESTORATION
VILLAGE CHURCH PARGNY-FILAIN Aisne
BUILT IN THE XIITH CENTURY AND UTTERLY
DESTROYED IN THE XXTH CENTURY
NAVE
ST NICHOLAS
CHAPEL
STALLS
ALTAR
STEPS
CHAPEL OF THE VIRGIN
SACRISTY
PLAN
Scale


Restoration
Village Church
Pargny-Filain Aisne
XIIth Century
Transverse Section
Scale


Village Church Pargny-Filain Aisne XIIth Century
Restoration
Front Elevation
Scale

(*Continued from page 259.*)

The aeroplane photograph shows this poor little village several days before the beginning of the great French drive of September, 1917. When the photograph was taken (22 Sept., 1917) the Boche was in the town—there were (as one can easily see in the photograph) many houses, of which some of the walls were still standing. The church (marked by a cross in the photograph) is a grand "blank." Churches ordinarily have towers or steeples, and the all-seeing eyes of the artillery, whether Allied or enemy, did not leave many towers standing in their pathway. Consequently, the site of the church in almost any village is easily distinguished by its emptiness.

Several days after the photograph was taken the French occupied the town, and several days later again they found it necessary to leave it. In those two intervals of several days the walls which appear in the photograph disappeared, and to-day it is very difficult to find even a cellar which remains.

The plan of any vaulted edifice is the *result*, and not the cause, of the system of vaulting employed. Hence, by a sort of converse reasoning, given the plan, one

2. THE PLAN

knows at once the system of vaulting that was employed. The section likewise and the façades as well are the *results* of that system of vaulting.

Knowing that the designers and builders of the Middle Ages in France employed the system of measures based on Charlemagne's foot, viz.: 12 pouces (inches) = 1 pied (foot); 6 pieds (feet) = 1 toise (2 yards), etc., the writer has believed it wise to measure buildings of that period with the measure by which they were laid out, and not with the metric measure in use to-day. When buildings of the Middle Ages are measured in the system in use at the time one is struck at once by the recurrence of the number 3 ("cabalistic number"), and the number 7 ("holy number"), in the dimensions of those edifices. Also there were certain well-established rules of proportion employed by the architects of the Middle Ages in laying out their designs; rules based on three triangles, as will appear later.

The width of the nave, for example, is 3 toises (18 feet), the diameter of the columns or piers is 3 feet, the intercolumniation in the nave is 1½ toises (3 by 3 feet), etc.

In the country surrounding Pargny-Filain (a stone region), ever since time immemorial, the quarries have turned out building stones of a single size (called "parpaings"), 1 foot by 1 foot by 2 feet. When the wall is 1 foot thick, as the walls of the aisles, it is of a single thickness of the dimension stone; when 3 feet thick, it is composed of an interior and an exterior facing of the dimension stone, with rubble filling between, and with now and then a stone turned endwise to assure the bond.

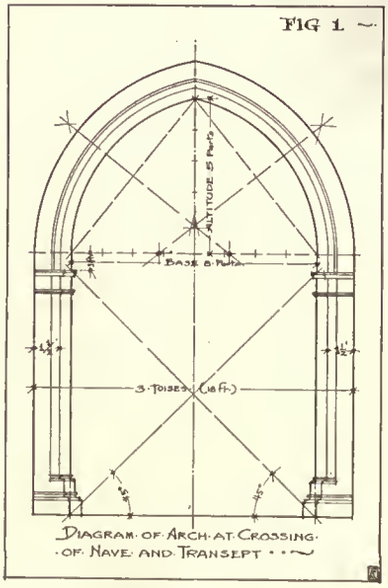


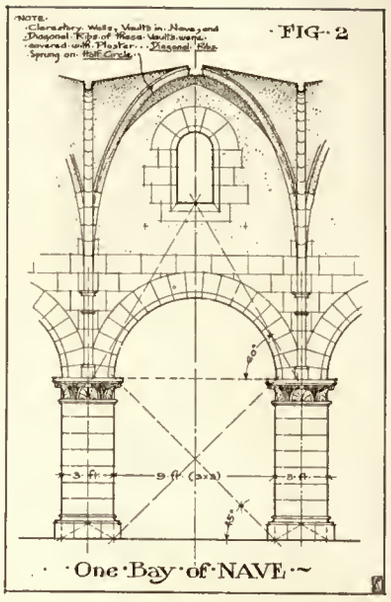
FIG 1.—DIAGRAM OF ARCH AT CROSSING OF NAVE AND TRANSEPT

The paving was of the same stone sawed in two (6 inches by 1 foot by 2 feet) excepting in the choir and the sanctuary, where it was in tiles of a harder and darker stone, with small squares of black marble at the intersections of the tiles.

From the photographs mentioned above the number of courses was counted (the courses were always, in that region, 1 foot high), and the height thus established. In addition, the height was

3. THE SECTION

based on a line at 45 degrees from the floor to upper side of the capital, in the arch separating nave and choir. The "generating arch" was based (as almost always) on the triangle which Viollet le-Duc calls "Ggyptian" (being the section on the diagonal of the Great Pyramid), and of which the base is 8 parts and the altitude 5 parts. The diagonal ribs of the vaults (as always, up to the decline), were half-circles—a fact which, even not knowing the principle, was demonstrated by the interior photograph. The ribs of the nave vaulting sprung from small columns resting on the capitals of the piers. The arches between nave and aisle were semicircular (souvenir of the Romanesque architecture, which commenced to die with the birth of the Gothic, of which latter it was the "natural mother").


NOTE.
Clerestory Walls, Vaults in Nave, and Diagonal Ribs of Nave Vaults were covered with Plaster. Diagonal Ribs Sprung on Half Circle
3 ft.
9 ft. (3 toises)
3 ft.
One Bay of NAVE
FIG. 2

The aisles were covered with a wood ceiling under the slate, with exposed rafters, and trusses on the axes of the piers. The thickness, or rather the "thinness," of the walls proves this, leaving out of the question the indications supplied by the "chantre."

The front elevation was naturally the *result* of the section. (The photograph found was of the side elevation). As regards the entrance doorway, there is perhaps some small room for doubt as to its *absolute*

4. THE ELEVATIONS

accuracy. The "chantre" told the writer that the "lintel was supported by 4 small columns—on the lintel were carved the 12 Apostles—above the lintel was a semicircular panel showing our Saviour with a winged animal on either side of Him."

The side elevation (which was clearly shown in the photograph) was again the *result* of the section. The gable of the south transept was in rubble—perhaps in accord with the architect's intention, perhaps because of a temporary shortage of "parpaings," perhaps the result of an accident followed by a "restoration." The window in the south transept was 1 foot off-axe. Why? There must have been a reason, for the architects of those days always worked with reason, but it is a reason that the writer has been unable to discover. The tower was in rubble with coins in "parpaings"—a head was carved on the axe, under the eaves, on either side. The covering was in those small, flat tiles, always a little warped, that one calls "Tuiles de Bourgogne," except for the aisles, which were covered with slates.

This little church impresses the writer as a most charming example of that *real architecture* which grows out of the soil as though belonging to it, and which expresses perfectly the character of the unknown masters who created it, and the simple, genuine people that have for centuries lived in and about it.

Permanent Memorial at Plymouth, Mass.

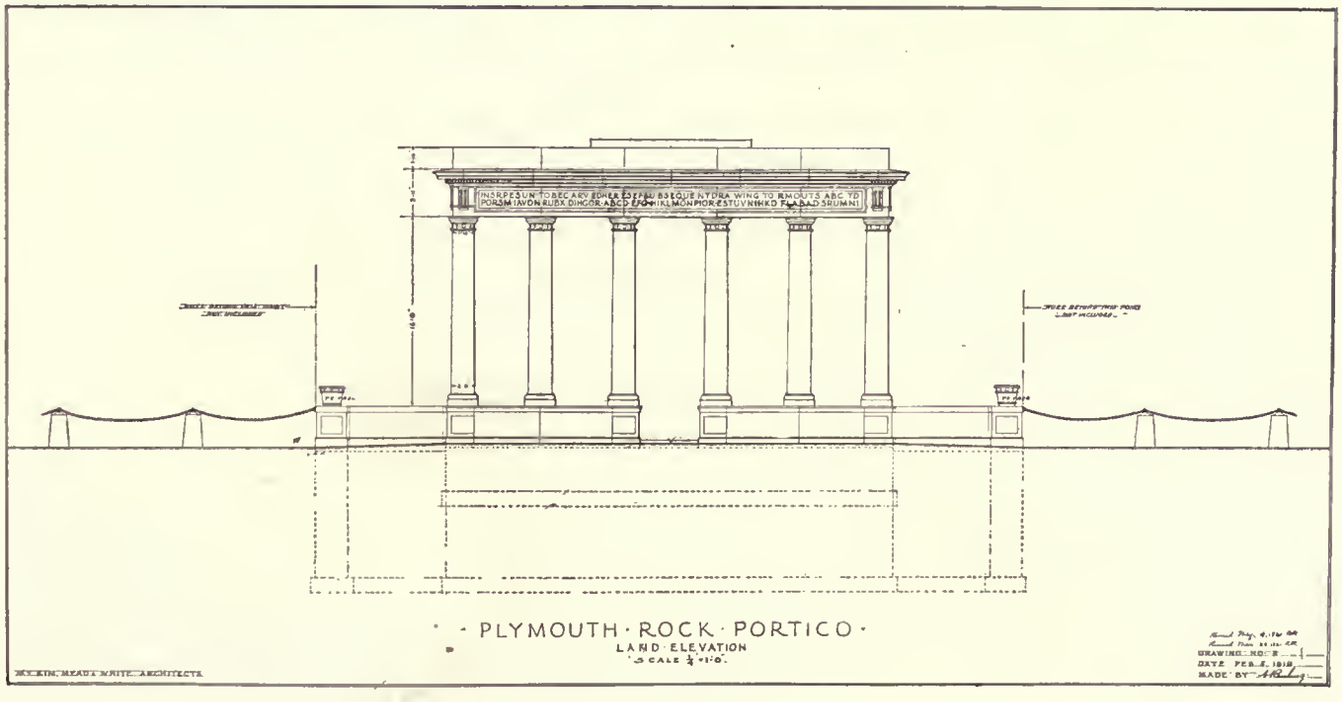
McKim, Mead & White, Architects

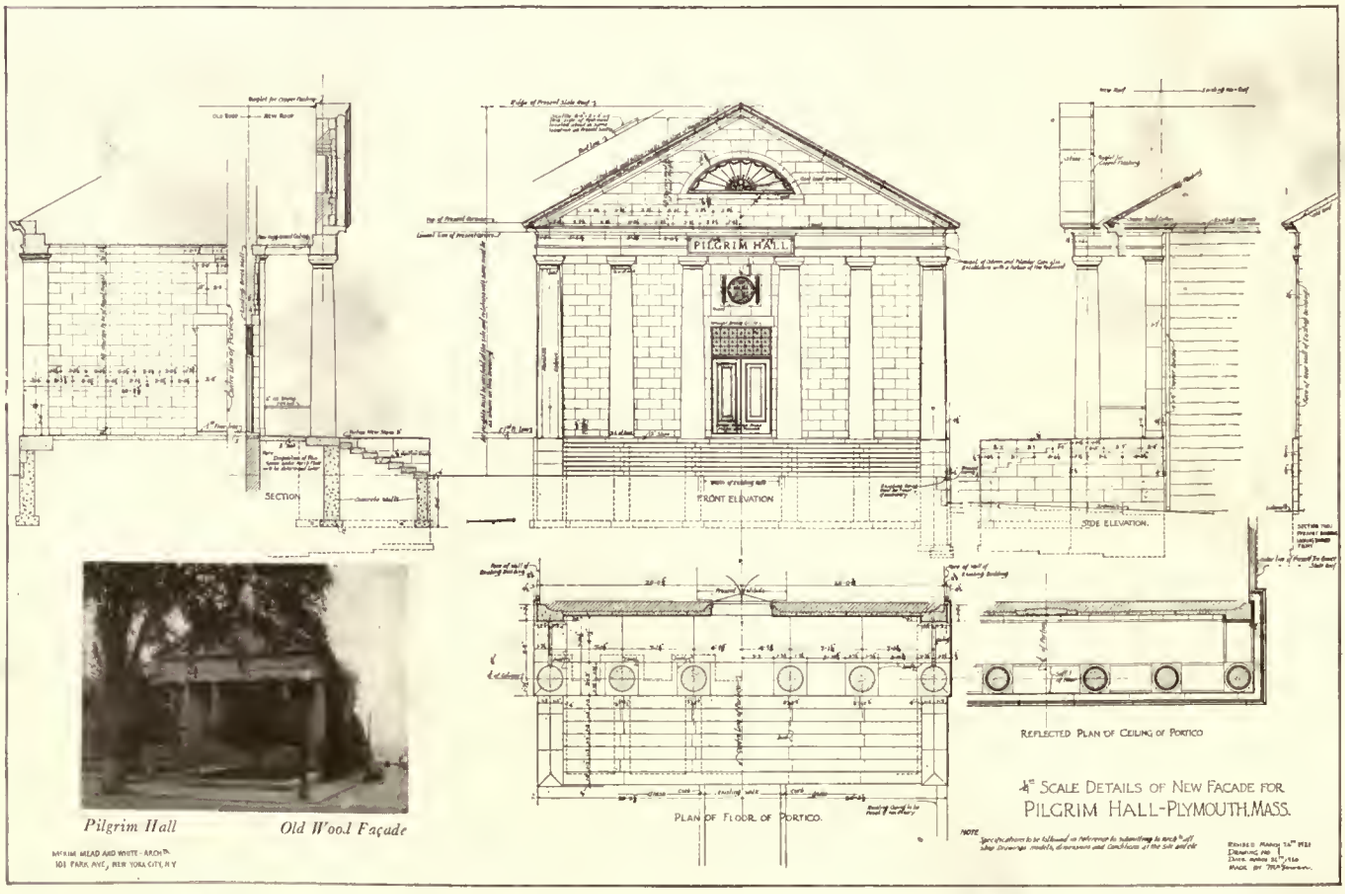
THE Pilgrim Tercentenary Commission have under construction the restoration and improvement of the waterfront at the scene of the original landing of the Pilgrims at Plymouth in 1620. The site has become a state reservation and the work is being carried out with the aid of State and Federal appropriations.

A part of the comprehensive plan is the removal of the old canopy over Plymouth Rock, lowering the rock to its original bed and the erection of the new portico which is the gift of the National Society of Colonial Dames of America. In the hillside facing the memorial it is proposed to place a beautiful memorial fountain with sculpture by Jennewein. This will be the gift of the Daughters of the American Revolution.

A new granite front for Pilgrim Hall is almost completed. It is a replica of the Doric entrance portico. The building was erected in 1824 by the Pilgrim Society as a monumental hall, but strangely the granite building had a wooden façade which has been changed and repaired several times. The present work is a gift of the New England Society of New York.

McKim, Mead & White are the architects for the above and other architectural memorial features.





PLANS, PILGRIM HALL. McKim, Mead & White, Architects.

A Pilgrimage to Plymouth

By Dwight James Baum, B. of Ar. A. I. A.

NOTE.—It would seem an easy matter at this late date to look through the average good library on colonial architecture and find illustrated examples of work in all the large centres of population in New England. After visiting Plymouth and taking a few photographs of its houses, the writer became interested in its primitive architecture and tried to get together further information on the subject. He was very much surprised not to find this data available even in the best architectural book stores or the New York public library. Finally the Plymouth Library Association was appealed to and they kindly loaned some of the original photographs, and these are reproduced in this article.

The Allyne House, built in 1639, taken down in 1826, was always considered the oldest house in Plymouth.

MANY volumes have been published describing the larger and more important works of the "colonial period" and also on the work in the main centres, such as Salem, Marblehead, etc., but the simpler structures, and especially in districts such as Plymouth, have been constantly neglected. These structures or the remaining few examples built by the pilgrims or their direct descendants give perhaps the best evidence of how instinctive and unaffected was the art of proper building as expressed by them. To create as they did, from crude materials without the aid of ornaments and in some cases, even mouldings, buildings that attract our admiration to-day shows an art that was devoid of all affectation.

The interest in the earlier houses lies in the splendid outline and carefully studied proportioning of window and door openings to the solid mass of plane wall surfaces. They achieve an unconscious relation of parts and proportion of openings to wall spaces and even glass divisions. Even the cornices, windows, and door architraves have a relation to the roof design and wall heights. Some of the crudities of design add a certain quaintness that would be lost by a refinement of design. That gambrel roofs were used with complete freedom and a perfect sense for their relation of parts again shows the frank handling without effort or affectation of the various fundamentals entering into the construction of these early houses. There seemed to be no rule of proportion for sometimes the gable is flattened and ample in width while in others the gable is restricted making for greater dignity and height.

When the early structures remain unaltered, they are beautiful in their sturdy proportions, outlines, and relations of ground-line to sky-line and chimney silhouettes. Occasionally one feature as a doorway would be worked out in a manner that showed a naïve understanding and appreciation of beauty in line and of fine detail. The scale of the entire structure was usually small except around the central chimney which was invariably the feature of the house. Low ceilings required less work to build, less material to hew, and were easier to heat and, therefore, the rooms were at first small for that same reason.

Ordinary tourists or sightseers would lose much of the charm of the town of Plymouth because it would not occur to them to go up the side alleys near business buildings on the main streets. The writer has found behind these, charming little houses which had been either moved back or built in front of the march of so-called progress and growth.

These New England towns are like no other place in the world. They express qualities of sincerity which we to-day find difficult to comprehend. The unpretending houses of other years, spreading elms and gray stone walls, blend into something forming the spirit of New England.

Each little town centres around a green, sometimes a triangle, sometimes a narrow rectangle and again a square. These greens are usually dominated by a quaint church. Houses usually are much alike, being simple square boxes two stories in height or one story with a gambrel roof giving the second-story space inside of rather steep roofs. The plans showed little variety, a nearly square rectangle so that the mass was a simple block, sometimes relieved by low wings and these probably later additions. And yet the old carpenter-architects produced endless variations with so simple a theme. They excite our interest, and by their variety of detail hold it even more than much larger structures.

Following the log-cabin stage, come the beginnings of American architecture, based on precedents brought from

(*Continued on page 268*)

Spring Street, Plymouth.

DOTON HOUSE, PLYMOUTH. (Now Demolished.)

WILLIAM CROWE HOUSE, PLYMOUTH, 1664.

KENDALL HOLMES HOUSE, PLYMOUTH, 1666.

PILGRIM MEERSTEADS, ALONG TOWN BROOK, PLYMOUTH.

JOHN ALDEN HOUSE, DUXBURY, MASS., 1653.

STANDISH HOUSE, DUXBURY, MASS., 1666. (Built by a son of Myles Standish.)

OLD OAKEN BUCKET HOUSE, SCITUATE, MASS.

BRADFORD HOUSE, KINGSTON, MASS., 1675.

The Shaw House, Court Street, Plymouth. Built before 1701. *Photograph by Lilian M. Hobart.*

(*Continued from page 265*)

overseas yet full of originality, expressive of strong Puritan character and well adapted to their needs. Necessity and utility were the dominating influences, therefore there is a rugged beauty in the early Puritan pine houses and churches that reflects their love of home and reverence for God.

In some of the houses you can see manifested the builder's fearlessness, sturdiness, faith, and even hopefulness.

This architecture is not a slavish following of English precedents. It was tempered by the sojourn of the Puritans in Holland and by the changed conditions of their environment in the new country. Only recently have historians traced the influence of other than English inspiration although it has always been apparent.

Records of colonial days expressed in their literature made slight mention of the houses and if we were not lucky to have a few remaining examples of our earliest architecture standing, we would be picturing the colonists as living in rough log huts. After landing in this country, what really happened was that their temporary abodes were replaced by primitive houses with more or less finished craftsmanship. This happened with the Pilgrims after their landing in 1620, and, as is shown in some of the remaining examples, the æsthetic as well as the practical side of the problem was considered.

Masonry was used very sparingly, usually only in the foundations and chimneys. Clay was often used for mortar, the space between wall studs was sometimes filled with common home-made bricks of a soft character. The chimneys combined brick and stone, the hearths usually of the latter. Sometimes large tiles from Holland or England were used for the facings.

The primitive houses were in many ways different from the later and better-known colonial types both as regards exterior and interior. The houses were at first thinner and not of the square plan. The centre chimneys sometimes expressed on their sides the effect of pilasters which was never used on the later work and which recalled in a way some of the Gothic influence of the old world. The early houses were seldom, if at all, painted. The usual material, white pine, being left to weather. Some were probably painted at a much later date than their erection, but the green and white of the conventional colonial was a matter of later development.

While traditional methods of construction were brought over from the old world, the different conditions here rapidly changed these. Besides new materials that they were obliged to work with the difference in climate, severe storms, and changes in weather meant adapting their work to the new surroundings. This developed under these conditions results that were entirely distinct from those left in the old country.

If we had no other records of New England life, in its architecture, we could still trace its material and social progress. From the earliest crude farmhouses, to the later pretentious mansions, is expressed the struggles with the Indians, the fight for existence and, later on, the social life of the community. The early Plymouth houses express the sternness and simplicity of the lives of the people occupying them.

(*To be continued.*)

Editorial and Other Comment

To the Young Man Who Wants to Be an Architect

THERE are hundreds of young men in our colleges and schools who are inclined either by a naturally sensitive so-called artistic temperament or by association with those interested in the arts to look upon the profession of architecture or the practice of one of the other arts as an especially desirable field of endeavor. They acquire an appreciation, a responsiveness to things we call beautiful, and vaguely dream of achieving both material success and a distinct place in the community by following what they begin to speak of as their ideals. To such we owe much of the progress of the world in the way of creative things from the beginning of poetic expressions to the building of the Greek temples, the wonders of Roman construction, the aspiring spiritual work of the marvellous Gothic cathedrals, the beauty and richness of the Italian Renaissance. But many are called who have neither counted the cost nor really found themselves on the only road that arrives—the hard one of unremitting, patient, self-sacrificing work.

Mere aspirations of an æsthetic sort are soon dissipated by the discouragements that belong to any worthy creative endeavor and many failures are blamed on the world that began with the idea that in any art there is an easiest way. There's no royal road for the young man in our democratic times and we have been imbued with a very keen sense of the need for definite and well co-ordinated ideas for the accomplishment of any worth-while results. Vague dreamings must give place to downright and concentrated thinking along definite ways. It is not to the man with a so-called artistic temperament alone that we are looking for the big things, but to the one with an infinite patience and the capacity for the hardest kind of digging in.

We are prompted to these remarks by a recent interview with Cass Gilbert that appeared in the *New York Evening Post*. No one is better qualified by experience and accomplishment to speak to and for the young man who is thinking of architecture as a profession.

"If you are thinking of architecture as your profession," says Cass Gilbert, "ask yourself three questions before going into it. First, Is your motive to make money? Second, Do you think of architecture because you like art and things artistic? Third, Have you the irresistible impulse to build, to create? These are words of warning or words of encouragement, as the case may be, that ought to be said to young men in each of these groups.

"If you think you are going to find the road to fortune in architecture—stop right there. Don't go into it. There is a general misconception as to the financial profits of a successful architect. The same effort devoted to almost any other profession will pay you better. Granted that you reach the top of the profession and have sufficient knowledge to carry on and sufficient prestige to obtain important works, you will have a large and expensive office organization to maintain between jobs, and that will eat deeply into what you make when you are busy. Furthermore, it takes a great many years to attain to that proficiency, and those years spent in some other work will be more productive financially. Therefore, it is the part of kindness to tell you not to go into architecture if you only want to make money.

"A man in my work will find agreeable companions and intellectual occupation and attractive environment. If he has the spark, on which all the rest depends, he will find far more than that. But unless he has that spark, which is made up of love of his work, an infinite capacity for taking pains, and great persistence, he should stay out of architecture."

As to Style in Our Architecture

THE great American architect in the sense of a designer who will so far depart from all precedent as to make the man in the street want to wave the flag and remark, that is American all through, will, we hope, never be born. We have had a taste—a bad taste, we should say—of the kind of art that is called original, yards of morbid and decadent canvasses that to us speak only of decay and the passing of art.

Who will deny that we have developed a distinctive, wholesome, and highly original American architecture, may we not see it manifested in our wonderful modern business buildings? And truly no one will be inclined to question the vigor and re-creation of old ways in some of the recent designs for great memorials. Our heritage is all the styles of the ages and we are entitled to use what we need, not in slavish copying, but in a new interpretation in keeping with the spirit and the aspirations of our own times. So-called originality is too often the mere exhibition of an ill-equipped mind. There is a lot of originality in the work of the savage and in the mind of the child, but very little of it is worth preserving except in tribal records and the day-book of some fond parents. If we see elements of the Greek, the Gothic, or more of the Italian Renaissance in our architecture, let us be thankful our designers have the good sense to value the best in the past and the courage to show us that they can use the past in new ways.

The Articles by Mr. Pond and Mr. Walsh

MR. POND'S articles on modern problems of "Concrete Construction" and Mr. Walsh's on "The Construction of the Small House" will be continued in early numbers. We are sure that our readers will be glad to know this fact and will not begrudge these gentlemen the needed vacations that have prevented them from preparing articles for this issue.

Course in City Planning and Civic Art at Columbia

George Herbert Gray, A. B., A. I. A. Instructor

CITY planning is so broad in its scope and the term is so inclusive that it has been well designated as a super-profession, into which enter as specialists the highway, traffic, and harbor engineer; lawyers and financiers; landscape architects and architects. The purpose of the present course is to train men in a comprehensive knowledge of the general subject of city planning and the special subject of civic art, so that they may ultimately take their place either as co-operating specialists or as the directing head of city planning projects. For any who may wish to pursue the general course and emphasize special phases of the subject other than civic art, special direction in their studies can be arranged for through eminent specialists resident in or near New York.

The subject will be presented through

A. Lectures.
B. Field work.
C. Drafting-room work.

A. The lectures will cover the history and the development of types of cities in their relation to the general development of civilization, giving due importance to cause and effect as influenced by living conditions, available materials, and prevailing working facilities. In the study of modern cities, stress will be laid on special conditions in America and the solution of similar problems abroad.

B. The field work will consist of trips of inspection to various types of city development in New York and within reasonable distance therefrom. Sketches will be made of the finished work for comparison with the designs from which the work was executed.

Within a radius of six hours from New York there are a great number of communities large and small where are to be found the whole range of types of development of the various elements of city planning; housing in model tenements, in model industrial groups and suburban building parks; transportation facilities by water, rail, and truck, underground and overhead, with terminal, through, and local station developments; park and playground systems for communities large and small; civic centres for small towns and the monumental layout of the national capital. The importance of the advantages thus offered cannot be too strongly emphasized, particularly as it will be possible in many instances to have the designers explain their own work.

C. The drafting-room work will consist of the development of sketches, illustrative of the principles learned in the classroom by special readings and from field notes. As the general studies proceed, emphasis will be placed on the development of designs.

Equipment: Students in this course will have the advantage of the general equipment of the School of Architecture, including access to the Avery Library, one of the most complete existing collections of works on architecture and allied subjects.

Prerequisites: (a) A general schooling equivalent to two years of collegiate work in a recognized college, and (b) training in design in a school of architecture or landscape architecture equal to three years' work, or an equivalent in office training.

This course begins October 5, 1921, in the Winter Session, and February 8, 1922, in the Spring Session.

Students desiring to take this course are required to enroll at the office of the Registrar, Room 315 University Hall.

For further information address the Secretary of Columbia University, New York City.

The Architectural Exhibition of the Thumb Tack Club of Detroit

An Architectural Exhibition is to be held, under the auspices of the Thumb Tack Club of Detroit, in the galleries of the Detroit Institute of Arts, October 17 to 30, inclusive.

Inquiries regarding exhibits and Year Book may be addressed to Mr. Wm. E. Kapp, 710 Washington Arcade, Detroit.

Book Reviews

THE AMERICAN HOSPITAL OF THE TWENTIETH CENTURY. A Treatise on the Development of Medical Institutions, Both in Europe and America, Since the Beginning of the Present Century. By EDWIN F. STEVENS, Architect. The Architectural Record Co., New York.

We are glad to acknowledge the new and revised edition of Edward F. Stevens's valuable and comprehensive book on "The American Hospital of the Twentieth Century." It is of value not only to every architect but as well to all concerned in the construction and administration of the hospital of to-day.

This book, originally published in 1918, is recognized as the standard authority on the subject of hospital planning, equipment, and management. The first edition was sold out in a little over two years. The revised edition has been entirely rewritten, and much new material has been added. Instead of 274 pages with 350 illustrations and floor plans, it consists of 380 pages with 480 illustrations and plans. We believe that this new edition will be invaluable to every one interested in hospital planning whether or not he possesses the first edition.

It discusses every ward and department of a modern hospital, including the kitchen and laundry, devotes special chapters to heating, ventilation and plumbing, details of construction and finish, equipment, landscape architecture as applied to hospitals, and concludes with about 15 pages devoted to war hospitals.

DESIGNS FOR AMERICAN HOMES. By H. G. OUTWATER, American Society of Civil Engineers; Designs by CHARLES M. NOBLE, Society of Beaux Arts Architects; Drawings by H. R. HUNTLIFF, Society of Beaux Arts Architects. Contents: "Developing the Idea," "Selections of Materials," "The Function of Architect and Builder," "Designs for American Homes." Dodd, Mead & Co., publishers, New York.

The designs include types from the small, inexpensive bungalow in various examples, chiefly of colonial derivations constructed of vatious materials, wood, stone, brick, stucco, etc.

The text is addressed primarily to the lay reader, but the architect will find the designs and plans of interest and they may help him to solve some of the small-house problems that we hope are going to be abundantly provided in the coming months. All of the illustrations are from original designs drawn in line.

PLANNING CHURCH BUILDINGS. By HENRY EDWARD TRALL, M.A., Th.D. American Baptist Publication Society, Philadelphia, Pa. The Judson Training Manual.

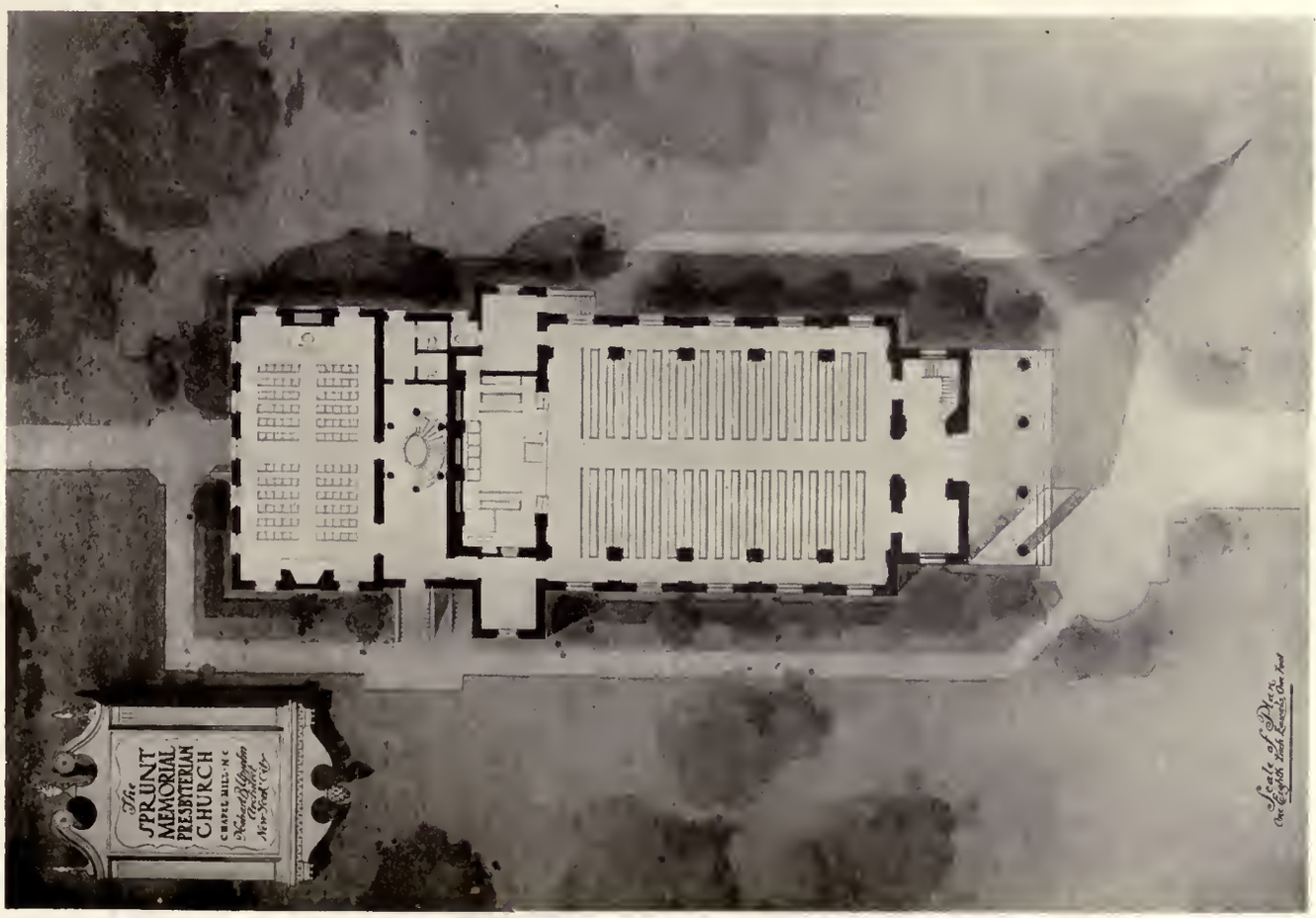
"How to Proceed"; "Building for Teaching"; "Departmental Requirements"; "Auditorium and Other Rooms"; "Size of Building"; "Planning for 400 to 700 Capacity"; "Planning for 300 Capacity"; "Planning for 100 to 200 Capacity"; "Planning for 800 to 1,200 Capacity"; "The Architect as Artist"; "Standard Check List for Committee and Architects," by George E. Merrill, A. I. A.

A COLLECTION OF ANTIQUE VASES, TRIPODS, CANDELABRA, etc., from various Museums and Collections, after Engravings by HENRY MOSES and others. With over 120 reproductions selected by JOHN TIRANTI. John Tiranti & Co., 13 Maple Street, Tottenham Court Road, London, England.

The designs included, taken mainly from Piraresi, make a book of value to designers in every field of endeavor.

SPRUNT MEMORIAL PRESBYTERIAN CHURCH, CHAPEL HILL, N. C. Hobart B. Upjohn, Architect.

CHURCH AUDITORIUM.



SPRUNT MEMORIAL PRESBYTERIAN CHURCH, CHAPEL HILL, N. C. Hobart B. Upjohn, Architect.

THE CIRCULAR STAIRCASE TO SOCIAL ROOMS.

SOCIAL ROOM FOR STUDENTS OF THE UNIVERSITY. Hobart B. Upjohn, Architect.

SPRUNT MEMORIAL PRESBYTERIAN CHURCH, CHAPEL HILL, N. C.

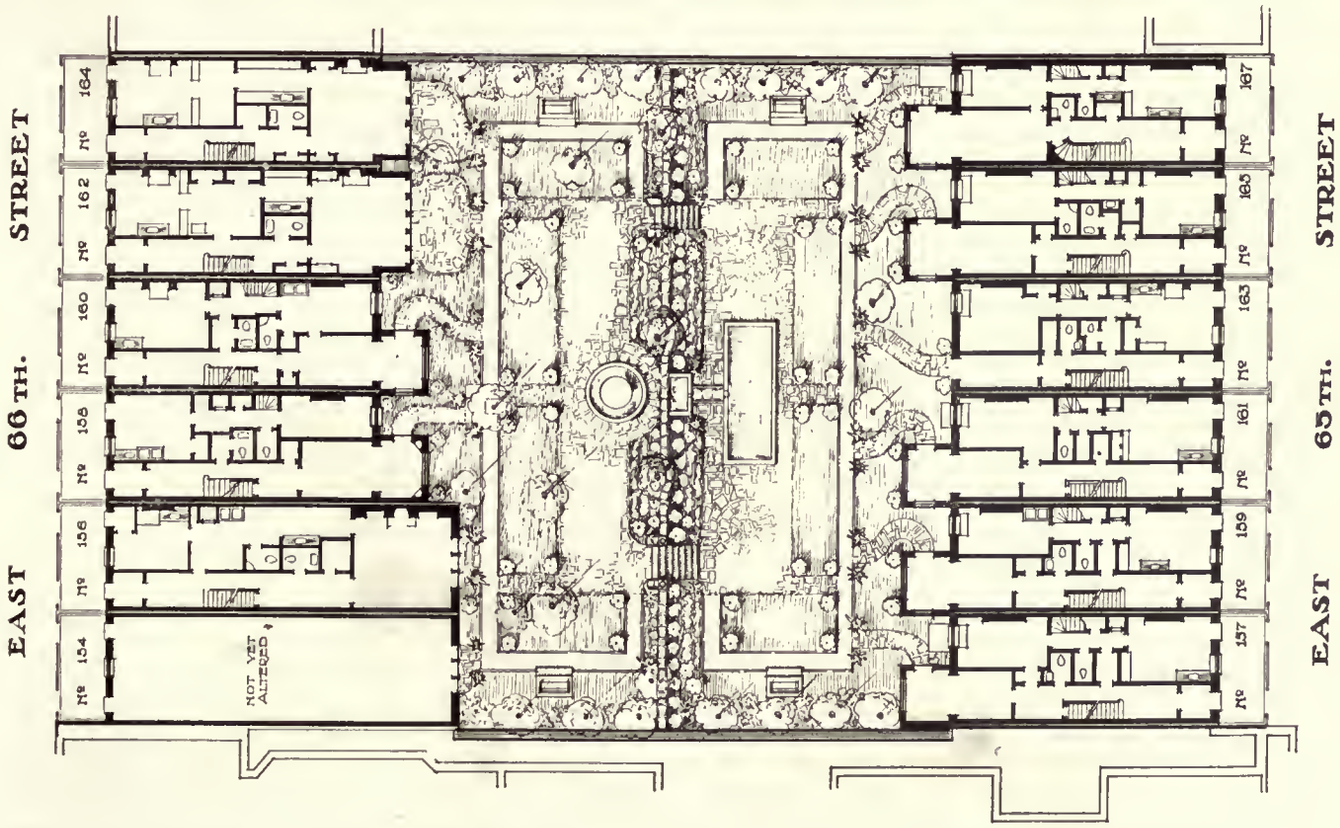
VIEW OF GARDEN.

VIEW OF GARDEN.

Edward S. Hewitt, William Emerson, Associate Architects.

65TH AND 66TH STREET GARDENS, NEW YORK (ALTERATIONS).

NORTHWEST CORNER OF GARDEN.



65TH AND 66TH STREET GARDENS, NEW YORK (ALTERATIONS). Edward S. Hewitt, William Emerson, Associate Architects.

LIBRARY, RESIDENCE, CORNELIUS H. TANGEMAN.

DINING-ROOM, RESIDENCE, CORNELIUS H. TANGEMAN. Edward S. Hewitt, William Emerson, Associate Architects.

65TH AND 66TH STREET HOUSES, NEW YORK (ALTERATIONS).

DRAWING-ROOM, RESIDENCE CORNELIUS H. TANGEMAN.

GARDEN-ROOM, RESIDENCE, MORGAN W. JOPLING.

65TH AND 66TH STREET HOUSES, NEW YORK (ALTERATIONS).

Edward S. Hewitt, William Emerson, Associate Architects.

LIBRARY, RESIDENCE, GEORGE M. BODMAN.

DINING-ROOM, RESIDENCE, PHILIP L. JAMES. Edward S. Hewitt, William Emerson, Associate Architects.

65TH AND 66TH STREET HOUSES, NEW YORK (ALTERATIONS).

ENTRANCE-DOOR, RESIDENCE, ARTHUR W. PAGE.

GARDEN-ROOM, RESIDENCE, ARTHUR W. ROSSITER.

GARDEN-ROOM, RESIDENCE, ARTHUR W. PAGE.

ENTRANCE-HALL, RESIDENCE, CHARLES J. SYMINGTON.

65TH AND 66TH STREET HOUSES, NEW YORK (ALTERATIONS).

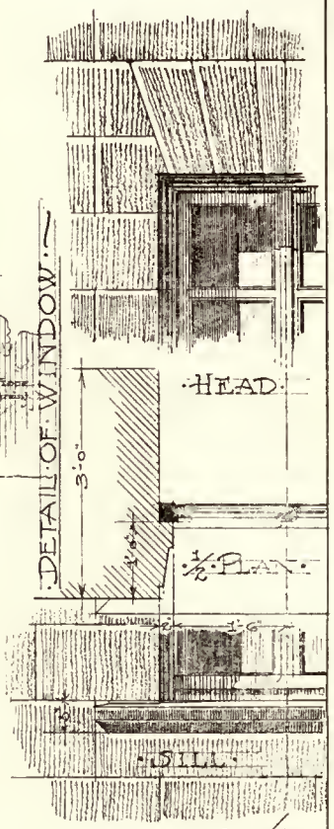
Edward S. Hewitt, William Emerson, Associate Architects.

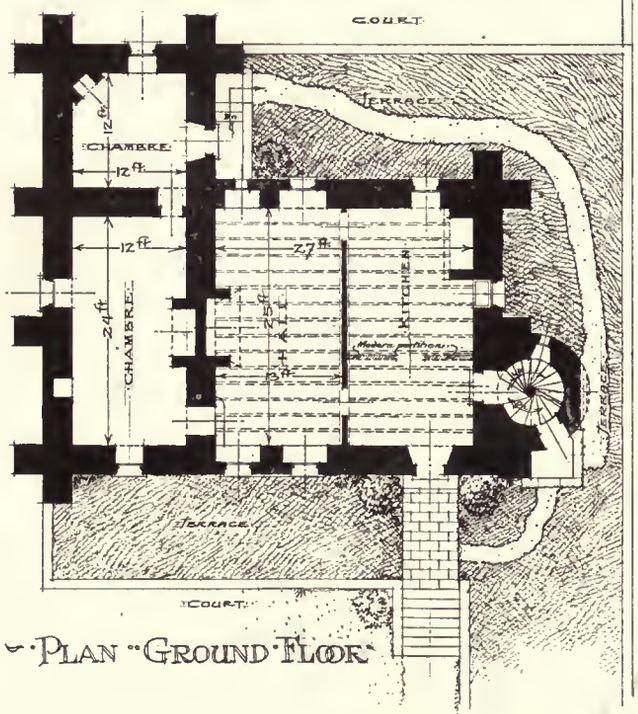
XIVTH CENTURY FARMHOUSE DEPENDANCE OF THE ABBEY OF PRÉMONTRÉ

NEAR FAUCOUCOURT — AISNE

ENTRANCE FRONT

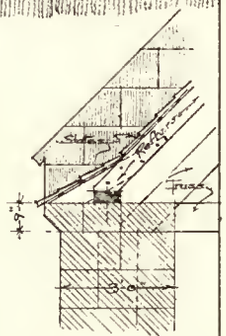
REAR ELEVATION





PLAN GROUND FLOOR

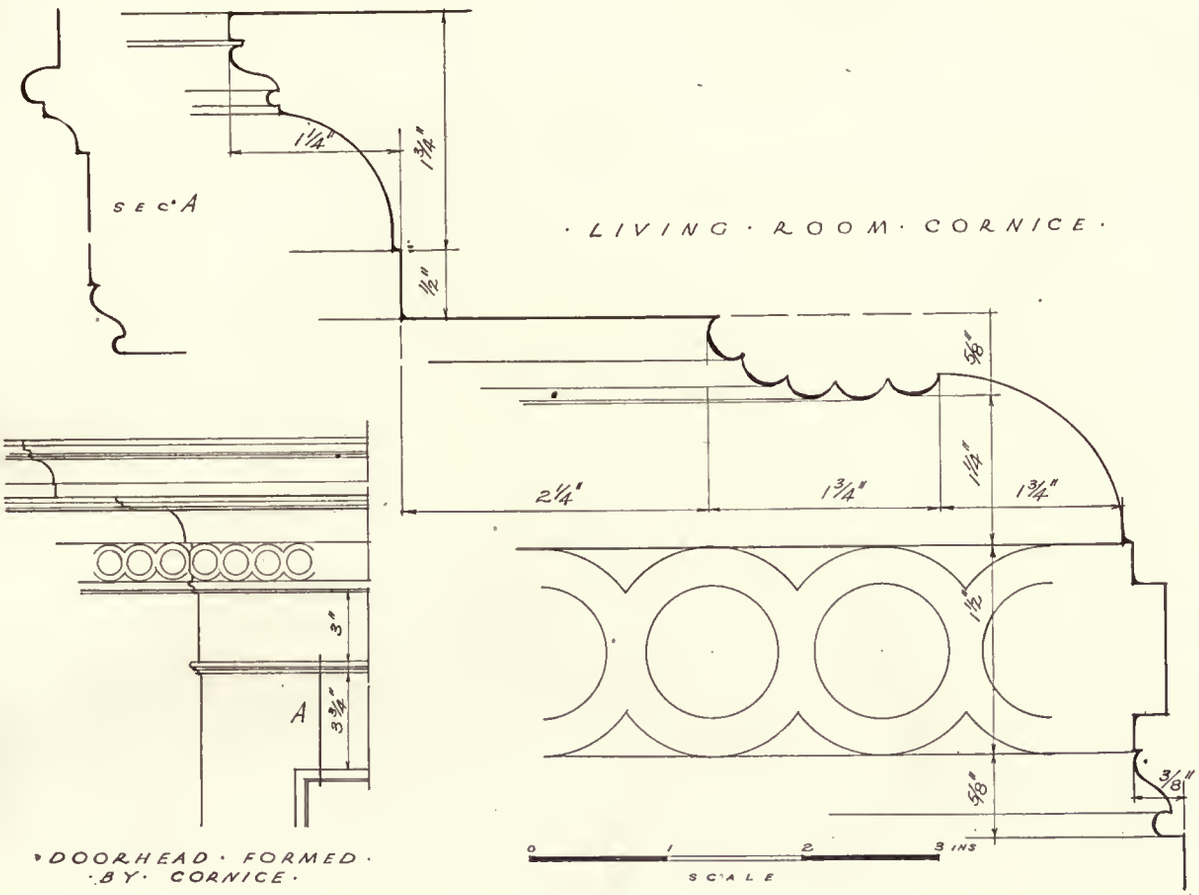
ELEVATION ON THE TERRACE
TOWARD THE ROAD

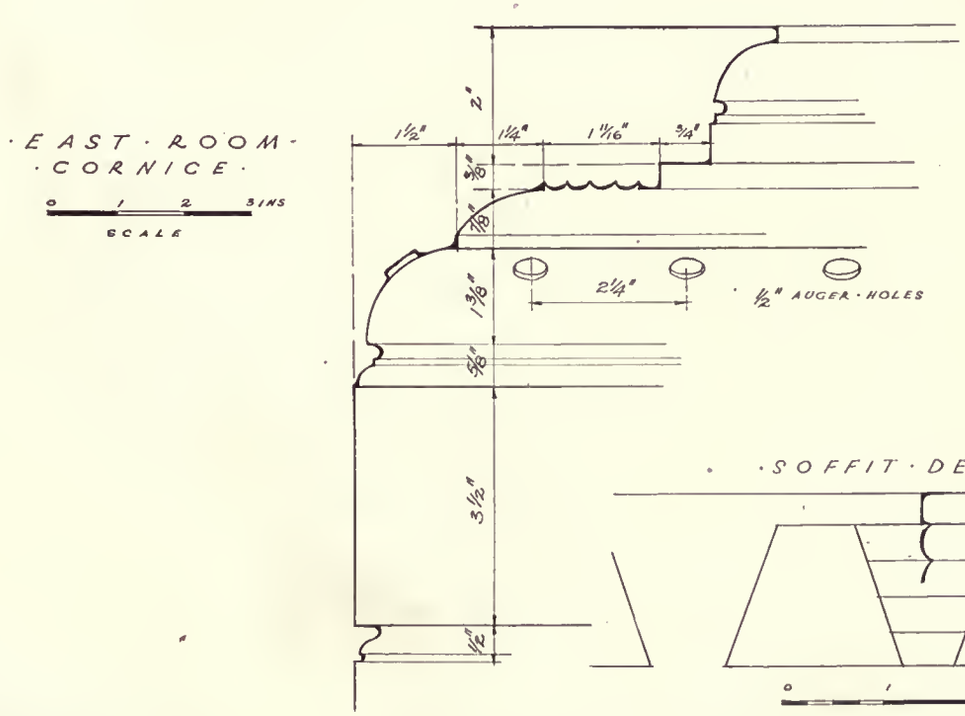


DETAIL OF CORNICE AND FINISH OF GABLE COPING

Scale: feet

Measured 1920 — Drawn 1921
H. Cunningham Architect





EARLY ARCHITECTURE OF SOUTH CAROLINA

· WOOD · CORNICES · IN · THE · CALHOUN HOUSE

BEAUFORT · S · C

MEASURED BY DWIGHT JAMES BAUM
DRAWN · BY VERNA COOK SALOMONSKY

HOWARD THEATRE, ATLANTA, GA. (PEACHTREE STREET).

Hentz, Reid & Adler, Architects.

STAIR-LANDING, SHOWING STAIR TO UPPER BALCONY.

LOBBY.

Hentz, Reid & Adler, Architects.

HOWARD THEATRE, ATLANTA, GA.

SIDE WALLS OF BALCONY.

PROMENADE.

HOWARD THEATRE, ATLANTA, GA.

Hentz, Reid & Adler, Architects.

ENTRANCE TO OFFICE-BUILDING.

FIREPLACE IN DIRECTORS' ROOM.

J. V. Phelan, Architect.

OFFICE-BUILDING FOR GENERAL MOTORS CORPORATION, NEW YORK.

LOUNGE.

ELEVATOR LOBBY.

J. V. Phelan, Architect.

OFFICE-BUILDING FOR GENERAL MOTORS CORPORATION, NEW YORK.

OFFICERS' DINING–ROOM.

DIRECTORS' ROOM. J. V. Phelan, Architect.

OFFICE-BUILDING FOR GENERAL MOTORS CORPORATION, NEW YORK.

Office-Building, New York

J. V. Phelan, Architect

THE office-building of the General Motors Corporation, located at the corner of 57th Street and Broadway, New York City, occupies an area of 16,800 square feet. The structure provided when erected for two separate and distinct buildings. The corner building was purchased first, and building south of it was purchased a few years later.

Both buildings were originally designed as loft buildings, and, being in the automobile district, developed into a general automobile building. The ground floor, entirely, was used as automobile sales rooms, and the upper floors for repair shops, paint shops, forge shops, upholstery, etc.

Upon the purchase of the southerly building in 1919, alterations were made to combine both buildings for the purpose of furnishing offices for the executives and other divisions and departments. The entrance from Broadway was eliminated, and a new entrance provided on 57th Street. All of the old elevators were removed, and new high-speed passenger-elevators provided at the 57th Street entrance.

The ground floor, used for automobile sales rooms, was remodelled. The first floor provides for public reception-room, rest-rooms, and locker rooms for the female employees, telephone and mail rooms, and general offices. The second to the seventh floors are arranged for general and private offices.

On the eighth floor is provided the general executive offices, directors' room, etc. The directors' room is on the inside of the building away from noise, and is provided with top light and artificial ventilation. The top light is controlled by means of a ventilighter placed between the skylight and diffusing sash, and operated from a secret panel in the side wall.

The ninth floor, which is the roof, provides the officers' dining-room and service-rooms, barber shop and bath, and toilet facilities. They are located inside of the structures found on the roof of the original building except the additions constructed for the new elevators.

The space occupied by the dining-room was originally a forge room. The kitchen and serving-room were provided inside of a large automobile elevator penthouse.

The decorations of the rooms and the furnishings are by the Hampton Shops.

Sprunt Memorial Presbyterian Church

Hobart B. Upjohn, Architect

By Aaron G. Alexander

Rear of Sunday-school building.

IF you have had the pleasure of visiting the University of North Carolina, situated in Chapel Hill, and wandered across its beautiful campus, you undoubtedly have noticed, directly across the main street, a church nestling in among its picturesque surroundings. You probably thought it one of those rare old gems which had been overlooked when you were South collecting photographs for the enlightenment of the architectural profession.

Through the generous co-operation of the donor, Mr. Upjohn has erected a building which harmonizes so well with its surroundings that one feels as though it might have been standing a hundred years. From the graceful, stately lines of the front portico, and the fine proportions of the spire, you see that a skilful hand has designed the building. The colonial texture in the brickwork obtained by using a local product, the brick steps and quaint door to the Sunday-school, and the rear of the Sunday-school building with its gabled end and large chimneys against the choir room gable and church, terminated by the spire, strengthen the impression.

The church auditorium with its pure Doric pilasters between the arches is in perfect proportion. In each arch is an old window the glass of which is a light amber tone, which casts a soft light over the seats finished in old ivory with mahogany rails and top. Around the windows hang curtains of blue and gold weave. The walls above the panelled wainscoting, which is finished in old ivory, are treated in a light buff color, and the whole, combined with the old brass candelabra, the organ front of fine detail, and the boxed choir stalls, makes a most pleasing and restful effect, and one's thoughts involuntarily go back to the old New England meeting houses.

Passing from the church through the choir room you find the Sunday-school room. At one end is a large fireplace while opposite to it is a platform on which are the original pulpit and chairs used in the old church which occupied the same site as the present edifice. The basement is reached by an elliptical staircase. A very homey room with bookcases, wainscoting, beamed ceiling, and a large fireplace opens off the basement hall. This room is used as a meeting room for the students of the university and is a very interesting feature. On the other side of the hall is a classroom, also with an open fireplace and built-in seats, which can be turned into a dining-room, as it connects with the kitchen.

You pass out to the street, feeling that you have spent a pleasant half-hour. A glance at the grounds shows that they as well as the surrounding rubble stone wall which is built up in the old-fashioned way without the aid of cement, have been laid out with the same care.

Waste in Advertising

By Louis Lott, Architect

MR. STOWE PHELPS, in his article "Reaching the Architect by Advertising," in this magazine, May, 1920, that was widely read and commented upon, made the statement that from 1 to 2 per cent of advertising is good, about 25 per cent fairly good, and the rest practically zero. These figures may or may not be absolutely correct, but at all events the above statement presents a stupendous aspect of lost opportunities, wasted resources, wasted efforts, wasted time, wasted materials, to the nation as well as to the individual, and would indicate, to use an analogy, very low-grade efficiency of the fuel used to steam up. However, far from disheartening the advertiser, it should rather stir him to find the reasons for such inefficient effort by means of a thoroughgoing analysis of the elements that go to make good and effective advertising, and to a determination to apply the remedy to his own needs; for certainly a much greater percentage than indicated above can be converted into effective advertising.

The following notes, based on long observation, contain points that are, or should be, commonly known, but some of them evidently are not given serious thought.

I will take up the subject under the following heads:

1. Knowledge of fundamentals. 2. Requirements of a good ad. 3. Composition of reading matter. 4. Composition of space. 5. Illustrations. 6. Catalogues, pamphlets, and letters.

KNOWLEDGE OF FUNDAMENTALS

The English writer Gilbert Chesterton, touring this country, delivered a lecture under the sensational and catch-all title of "The Ignorance of the Educated," in which he conveyed the idea that many an educated person is ignorant upon subjects correlated to his occupation, of things he writes about, of phrases he uses, and, for that matter, this may apply to some parts of this article! In all events, it applies very much to the average advertiser who, more likely than not, proceeds along the lines of tradition and previous experience, and in every magazine issue proves his lack of knowledge and consideration of fundamentals, proper estimation and consideration of the other fellow's problems and time allowance, art, and lack of concentration in the ad. The reasons for the latter and a consequent ineffectiveness or total worthlessness can be summed up to be a discouraging length of reading matter, a lack of clearness, small type, crowding of space, helter-skelter arrangement of type and illustrations; in other words, restless, fussy composition, and absence of the right kind of interesting, attention-compelling features upon which to fasten the eye and then the mind.

Much of that which is said in the following when properly modified to its particular use should hold good in all advertising. It should be understood, however, that the ad that will bring results from the trade or the one which will make a successful appeal to the lay public may arouse little or no interest in the architect, if it has failed to take into consideration the dual factors involved in his calling, namely, practicability and art, which would make it advisable to present to him pertinent, practical, reliable data in a concise, attractive, orderly manner, that will at once compel his attention.

Therefore, in order to proceed intelligently with advertising material that is intended to command his interested attention and respect, it is necessary to understand what are the peculiarities of his calling, which for better understanding are here recited at some length.

THE ARCHITECT'S PROBLEMS AND TIME ALLOWANCE

There is probably no other profession in which the individual is called upon to give more professional service, coupled with business and professional responsibility, nor one that deals with more problems and crafts, that bring him in contact with a greater number and variety of products. His activities are widely diversified and consist of interviews, salesmanship, designing, specification writing, construction, superintending, consulting, bookkeeping, correspondence, filing, etc. Therefore, it can be readily understood that his time is a very precious commodity, which he must conserve to the utmost if he is to give proper consideration to advertised new materials and devices, as well as to the increasing complexity of building and the business side of his office. He must meet the increasingly exacting demands for expert service with an average small office force that has few specialized subdivisions, and the advertiser should understand that the architect subscribes to from one to a half dozen or more professional magazines which he is often compelled to look through rather hurriedly, and that in the course of the year he receives thousands of catalogues, pamphlets, and follow-up letters. How can he be expected to become interested in an ad if at the very start he becomes disheartened by the very length of the reading matter? Therefore, in his own interest, the advertiser should first of all be as considerate as possible of the architect's time, and present his matter in the most concise form.

Many advertisers endeavor to say too much in their space, thereby bidding for more of the reader's time and attention than they are entitled to, with the result that they often receive little or none at all. The reader hurriedly glances over it, there has been no concentration, the impression upon the mind will be confused instead of clear and firm, and the purpose of the ad more or less defeated. Therefore, all detailed information should be omitted or reduced to an absolute minimum, and then should be submerged in the composition of the ad in such a manner that the important announcements stand out clear and in themselves make up the ad, with the detail forming a background. All further arguments and information beyond the most essential should be presented in follow-up catalogues, pamphlets, and letters, to which attention should be called. These should also possess the virtue of the greatest brevity and clarity.

Furthermore, consideration for the reader's eyesight must be shown. This does not necessarily call for large type, but for one that is sharp and well spaced, and that can be read with the greatest comfort. Newspaper publishers punish the public without heed, but unless the reader is particularly interested he is not likely to read an ad that requires an effort to do so. Remember you are asking the reader to read your ad; besides that, you are paying for it.

The ad should furthermore be simple, yet forceful with-

out being bombastic or screaming; the latter will only serve to irritate some readers.

It should be carefully worded and be easily understood without an undue amount of concentration and study. This may require hours or days of patient and painstaking selection, arranging, and rearranging of the wording, but the result obtained will be worth the effort.

And, above all, the ad should be *honest*. One of the foremost commercial research men recently said: "There is one thing advertising will not do. It will not build a permanent market for an inferior product. The more a manufacturer advertises unworthy merchandise the quicker he brings about the dissolution of his business."

If the ad and the information contained therein have proved misleading to the architect he is most likely to remember this, for the advertiser must bear in mind the great responsibility the architect bears toward his client, who is usually not slow to lay the blame upon him for anything that goes wrong. If the improper use of any product is the cause for imperfect service the architect's reputation is placed in jeopardy. Therefore, the advertiser who desires to do business with the architect must co-operate with him in mutual service to the client, and furnish him with reliable information backed up by facts.

It must be clear, concise, and to the point, containing neither too much nor too little, refer to additional literature, such as catalogues, pamphlets, etc., and be in a type that is comfortable to the eye. It must be simple and easy to read and understand, be carefully worded and honest, and be forceful and interesting to the eye and mind. For it should be remembered that the ad is the silent salesman of the advertiser and must attract and hold the reader's undivided interest long enough to impress upon his mind the most salient points. Therefore, since it makes an appeal first to the eye its appearance must be so attractive, pleasing, and neat that it cannot be overlooked. The next thing is to make it so interesting that the reader will concentrate his mind upon it. It is then up to the article to sell itself.

REQUIREMENTS OF A GOOD AD

This should be most carefully and clearly worded and be concise. What a thing is and what it is good for should be easily discernible without necessarily reading through the entire ad. Very often the name of the product or that of the concern is the outstanding feature, but they do not always convey to the reader that which is intended, namely, what the name stands for.

COMPOSITION OF THE READING MATTER

The one great factor that is possibly less understood and which has received less competent attention than any other, and the one that in my opinion is responsible for many failures in advertising, is composition of space. This embraces a proper relation of used to unused space, including placing, size, and kind of illustrations and the kind of lettering and its distribution; in other words, a proper distribution of black and white, whereby the finished ad will appear pleasing and restful to the eye, and the eye should, moreover, easily focus itself upon the attention-arresting features. Thus the reader without any effort will first behold something interesting and harmonious, thereby preparing his mind for the mental absorption of the meaning and contents of the ad.

COMPOSITION OF SPACE

In order to accomplish this the composition should be as severe as possible, the more perfectly symmetrical the better. This, however, does not apply to illustrations in themselves. Very often one will find an ad with illustrations scattered helter-skelter all over the space in a would-be artistic disorder. Also one will find up to a dozen or more different kinds and sizes of type and lettering used, sometimes placed at all manner of angles. Such an ad is jumpy and jerky, much after the fashion of a strongly vibrating movie which causes distinct physical discomfort. How can people be expected to be attracted by, and concentrate upon, such an ad and search out its meaning?

In order to be successful an ad need not necessarily be accompanied by an illustration, but here, as above, the importance of composition or the relationship of black to white comes in, and the selection of the proper type and its spacing may make all the difference between success and failure. However, because of the fact that almost every person of any age is attracted by pictures, and that an illustration can often convey more than a whole page of print, and because it appeals to the imagination and sets it to work, the selection of some kind of illustration or attractive ornamentation would seem desirable and worth while.

ILLUSTRATIONS

Generally speaking, illustrations should be sharp but not hard, and of a size that, again, will not strain or confuse the eye in the least. They should be as original as possible, and be selected with the greatest care for appropriateness and artistic quality; the illustration must stand out and yet tone in with the whole composition. It might be said here that the possibilities of some mediums, such as photography and etching, have barely been touched.

Judging from the average artistic quality of the ads shown in our magazines one would conclude that the average advertiser is a poor judge of art and, moreover, as a man of affairs does not have a very high opinion of this field of endeavor in that he does not engage competent counsel to assist him to determine what is good or bad.

As a matter of fact, art has very much to do with successful advertising. With rare exceptions, only the well-trained artist in design can produce a satisfactory "Composition of Space" and illustrate an ad in such a manner as to give it its attention-commanding quality. The average commercial art talent now employed in the advertising field is not producing the best class of work. Nor is the best available talent apparently as often employed as it should be. Once a higher standard is set and the demand for the best increases, this demand will be met by the various schools for industrial design scattered here and there over the country. Therefore, in the measure that the average business man and advertiser becomes interested in and supports the art schools, institutes, and museums in our various cities and consults with competent representatives of the class of people he intends to reach with his ad, in that measure will he turn out better and more efficient ads and, incidentally, better-looking manufactured products which will be more readily sold, have a wider market, and better meet competition.

The day may not be so far distant when advertising will be recognized by all advertisers as a real art, and when more artists of unusual ability, lured by adequate patronage and remuneration, will enter into this field. In certain special fields of advertising this day has arrived.

Summed up it might be said that besides such advertising as is wasted because it is often not even noticed, let alone read, there is much that could be more effective in a smaller space if properly composed, others are ineffective either because the space is not large enough or too crowded, or because of lack of effective composition and wording.

In order to proceed intelligently with the make-up of

this sort of material the manufacturer should recall what has been said about the architect's time. The question of art is here of less importance than is clarity, brevity, and concise information. However, there is something more than just advertising involved in this sort of material, to wit, real scientific, reliable information, and specifications resulting from extensive research work and tests. Some industries are already distributing such data, which is of great help to the architect. On the other hand, some industries are in the habit of sending to the architect pamphlets containing factory news and other lengthy and useless printed matter that may contain some good information, worthless to him because it would take too long to dig it out, consequently it goes into the waste-basket. Others send out elaborate folder sheets with printed matter and illustrations spread helter-skelter over the entire space, and in order to make it more barbaric and confusing different colored inks are used. Most of this is also worthless. Others send out illustrated material sometimes elaborately gotten up, which does little credit to these firms and industries, and, what is worse, is directly demoralizing the to profession in that such material, not having been edited by a competent discriminating person, contains very crude examples of so-called architecture, which the able architect will not keep. This sort of stuff may make an appeal to the ignorant, but it is not worthy architecture and should not be sent broadcast.

CATALOGUES, PAMPHLETS, AND LETTERS

In regard to size of catalogues, etc., it ought not to be a superhuman task to divide industries, first, into unrelated groups and have these get together and agree upon a uniform-size sheet, and then to get the related industries within the group to agree to use that size. This would be a material help for filing purposes.

Summed up, catalogues, etc., should follow up magazine advertising and should contain nothing but honest, solid information, presented in a clear, neat manner, in the most boiled-down tabloid form. Letters should be clear and likewise of the greatest brevity.

If these suggestions are followed the architect, who is mostly inclined to be fair, progressive, and eager to learn, will give all of this information more attention than he has in the past. At all events, it cannot but result in a closer co-operation between the architect and manufacturer, and a much nearer 100-per-cent return to the latter—all of which can be accomplished through the exercise of greater care, discrimination, a more liberal use of gray matter, and less paper.

Announcements

The Society of Little Gardens

The Society of Little Gardens, of Philadelphia, announces a competition in the design of a garden treatment for the typical suburban "back yard." The purpose of the competition is to procure one or more designs which may be presented to the public to stimulate and guide the development of the out-of-doors space of the average American dwelling-house and to bring it clearly within the meaning of the word "home," now too generally limited to the space within four walls.

Eligibility.—All students of the garden problem are invited to submit designs under the terms of this programme; this invitation comprehending professional garden designers, draftsmen, and students in schools of architecture and landscape design. Nor is the amateur garden lover excluded, provided only that his ideas are presented in the technical form prescribed.

Write for information to Mrs. Charles Davis Clark, president, 2215 Spruce Street, Philadelphia.

Indianapolis architects are planning to take a large part in the Indianapolis Industrial Exposition, to be held October 10 to 15 at the Indiana State Fair Grounds under the auspices of the Indianapolis Chamber of Commerce.

Space has already been taken by more than four hundred of the seven hundred and eighty-one different lines of manufacturing in Indianapolis. One of the unique features of the exposition will be that the huge Manufacturers Building will be laid out in replica of the retail district of Indianapolis, with the world-famed Soldiers and Sailors Monument towering in the centre of the network of streets named after those in down-town Indianapolis.

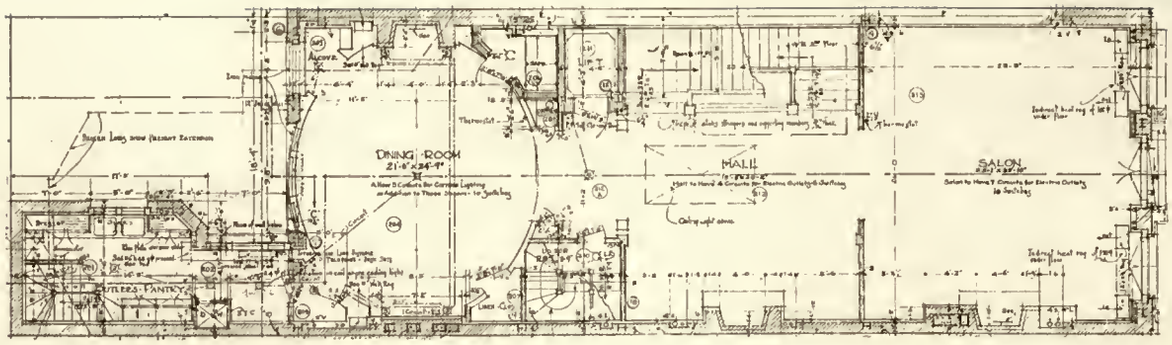
Edward F. Fanning, 4 East 39th Street, announces his removal on August 1st to 522 Fifth Avenue, New York City, Guaranty Trust Building, where he will continue his general practice of architecture.

Movies to Show You How to Save Coal.—The power of the motion-picture screen has been harnessed to the task of impressing upon American citizens the need of conserving coal, says Mr. C. J. Stover, secretary Manufacture of Pipe and Boiler Coverings.

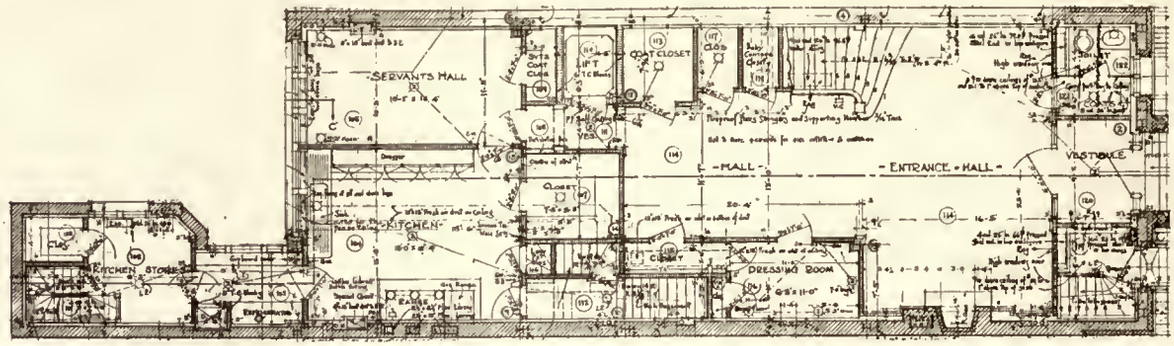
A one-reel film entitled "A Dollar Saved Is a Dollar Earned," which picturizes how the coal-bill can be cut down in the average home by the insulation of boiler and pipes, has been presented to the United States Bureau of Mines library of educational films, and will be circulated by the bureau throughout the country. In addition to this circulation, prints of the films will be available to distributing agencies, such as the Red Cross, Y. M. C. A., etc., which loan education films to churches, schools, and lodges without rental charge, the same as Carnegie Library loans books free.

The picture was produced under the auspices of the Pipe and Boiler Manufacturers of the United States by the Rothacker Film Company, of Chicago, which has made a number of the films now in the bureau's library.

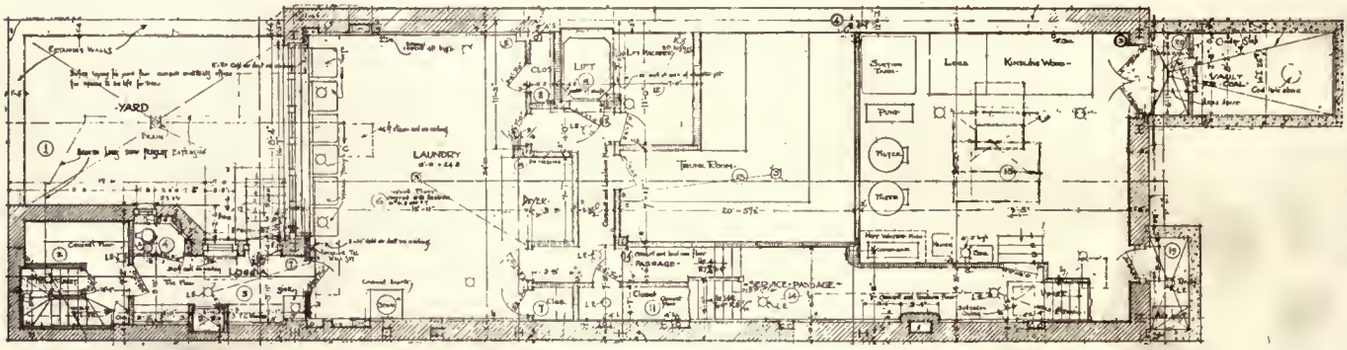
Architects will be glad to receive the interesting and valuable new service literature of the Indiana Limestone Quarryman's Association, showing typical details for enclosing walls built of Indiana limestone ashlar with hollow-tile backing. The two Series "D," Details and Data Sheets, and the four Series "E" Plates will compose the first mailing which will go forward to architects. The Series "D" Sheets will be devoted entirely to showing details of construction and data connected with the proper detailing of cut stone, and showing new ways of using it in connection with modern building construction. The Series "E" Plates are intended to illustrate good examples of recent Indiana limestone work of all types in a convenient form for separate classified filing.



SECOND-FLOOR PLAN.



FIRST-FLOOR PLAN.

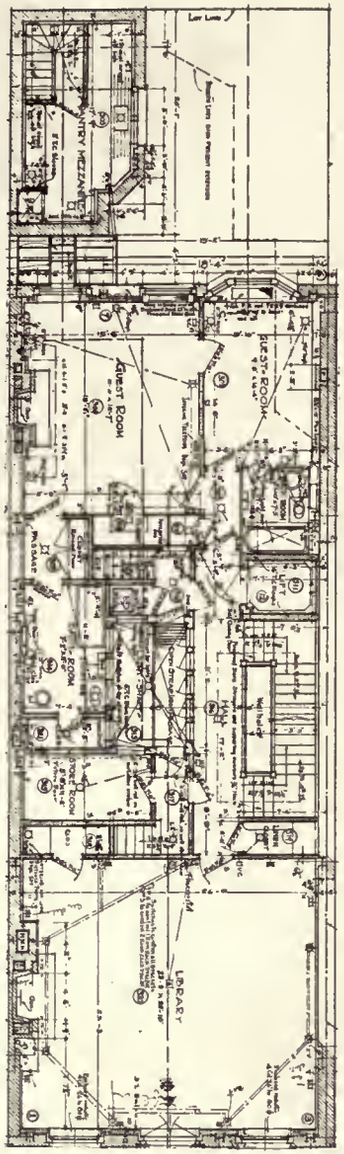


BASEMENT PLAN.

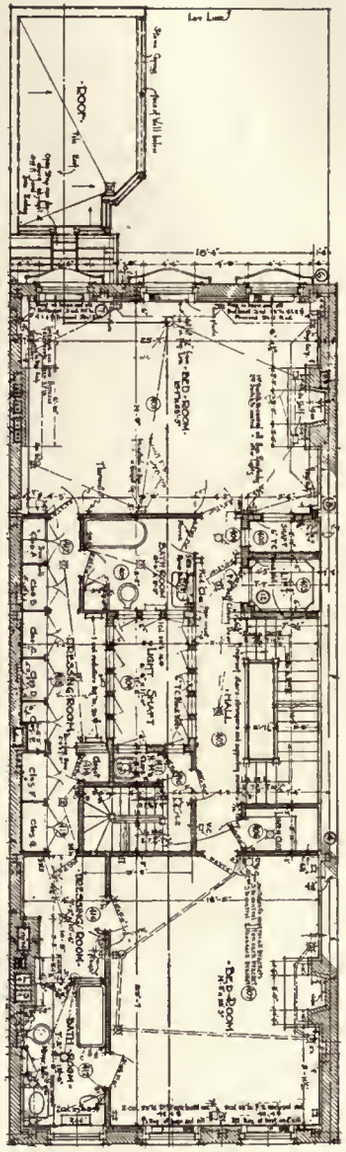
RESIDENCE, EDWIN JAMESON, 9 EAST 69TH STREET, NEW YORK.

Grosvenor Atterbury, Architect.

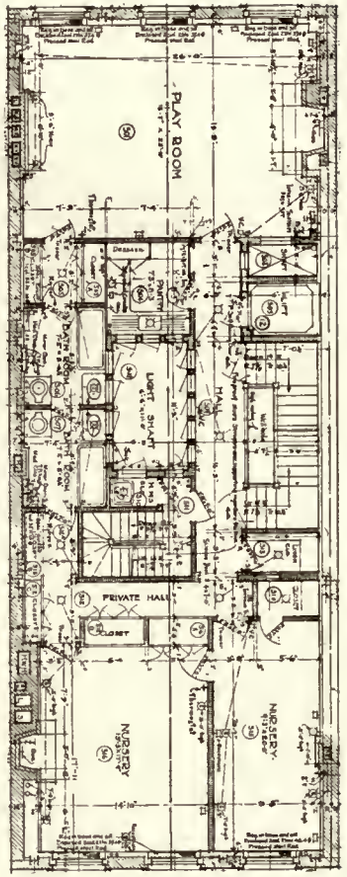
FRONT ELEVATION.



THIRD–FLOOR PLAN.



FOURTH–FLOOR PLAN.



FIFTH–FLOOR PLAN.

RESIDENCE, EDWIN JAMESON, 9 EAST 69TH STREET, NEW YORK.

Grosvenor Atterbury, Architect.

Liberty Memorial Competition, Kansas City, Mo.

Edward Buehler Delk and Armstrong & De Gelleke, Associate Architects

One of the Prize Designs

POSTERITY owes to those who courageously and loyally gave their lives to a great national cause some symbol of honor and gratitude commensurate with the services rendered. The World War called the young manhood from our homes, not to predatory conquest or defensive war, but for the conserving of those political principles and ideals which make for justice, freedom, and the democratic control of states. The valor of our soldiers was inspired by the hope that a righteous peace would be secured for the world, and that a new internationalism would emerge from the welter of international aggression and strife.

To the end that the people of Kansas City might give expression to their appreciation of such service and to such a hope as filled the hearts of our young adventurers on the high seas and battle-fields of Europe, her citizens projected an architectural memorial which would typify in a great and noble way the heroism, loyalty, and sacrifice of her sons.

In response to the invitation of the association having in charge the erection and execution of such a memorial, we offer in the same lofty spirit a scheme of structures and a memorial which we hope will meet the high ideals and generous purpose of the citizens of Kansas City. The admirable programme is a challenge to the best in human brain and heart, and we offer the results of our study of the whole proposal and a deepening passion to realize the desire of those who formulated the purpose of a fitting memorial.

Our plan contemplates not only the memorial but looks forward to a great development of cultural and civic buildings correlated to our main structure. The three features of our plan for the section of the city selected as the site of the varied group of buildings are:

1. The memorial; its approaches and surroundings, and immediately related the memorial building for the use of the living.
2. A group to be devoted to cultural ends—Art—Literature, Music, Natural History, and Museums.
3. A group of civic buildings such as post-office, city hall, armory and stadium, and other necessary structures in the conduct of municipal life.

The main feature of our plan is to correlate the business section of the city with the residential and park system, placing in the high centre of the city's life a commanding memorial which will forever recall the business and social life of the city to those ideal ends the realization of which makes for righteous peace and joy in human society.

We have placed the memorial so that the visitor leaving the great railroad station will pause and stand in almost awe at the rising terraces, the soaring shaft, and the commanding figure of Peace, which rises out of the very stones of which it is a part.

The topographical nature of the country—a land of plains and abrupt messas—called for the broadest and boldest of designs. We have ventured to transcribe in architectural forms the magnitude and spirit of the great mid-West. We confess to a desire to create an ideal expression of the ambitious West, and the men who have moulded its civilization.

From the beginning we have collaborated with James Earle Fraser, New York, sculptor; Jules Guerin, New York, mural painter; Edward H. Bennett, Chicago, landscape architect and city planner.

View of site from the Union Station.

The memorial is approached by wide stretches of stops and terraces. The retaining-wall at the first level will be inscribed with the names of the heroic dead and symbolic figures. Abutting the upper square are buildings the roofs of which form flanking terraces. Trees and pools, with their accompanying shade and splash, are about the memorial, and in this quiet a repose will be induced that breeds the atmosphere of peace and meditation essential to the full enjoyment and impression which the memorial should create in the lives of the people.

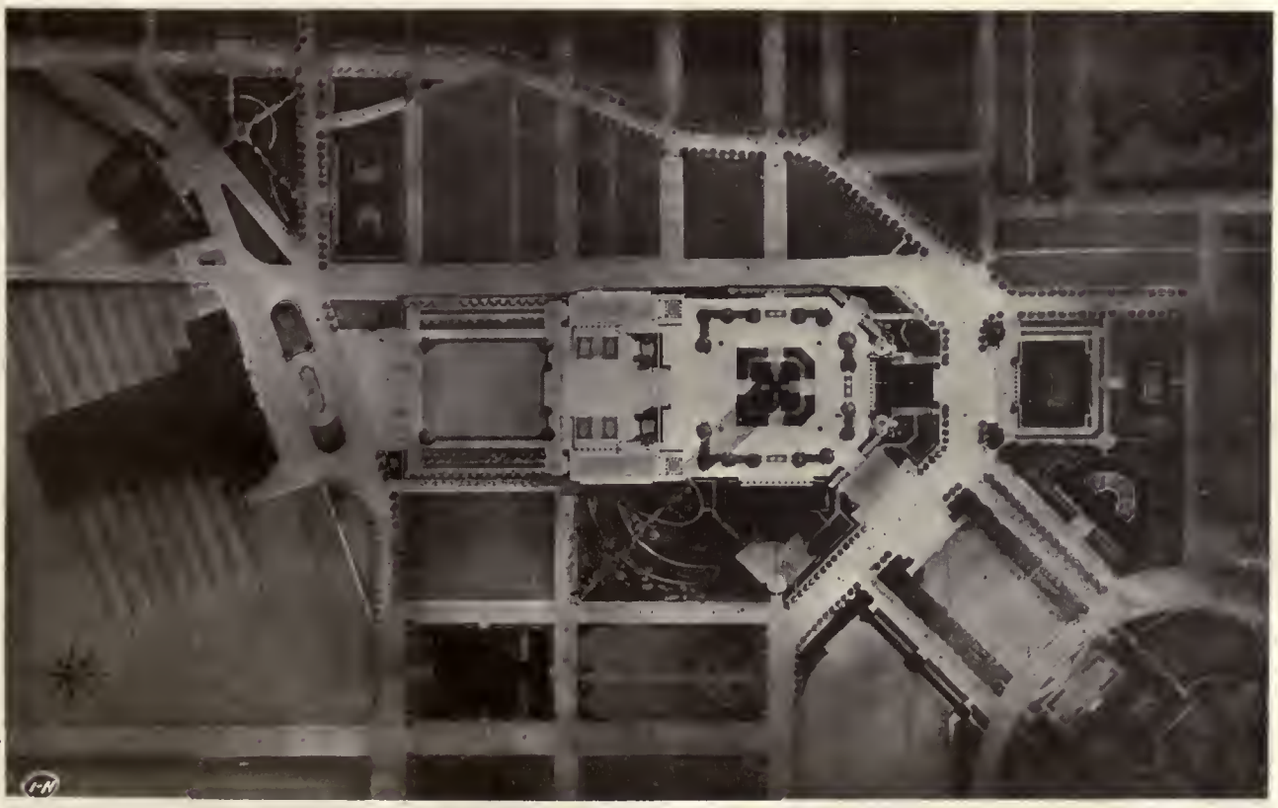
The memorial is not the reproduction or adaptation of any other shaft. The spirit of this people deserves a new expression of its unique spirit of aspiration. Its threefold character is simplicity, greatness, and aspiration. It stands for the New World's hope of a noble peace which has grown up out of the earlier conflicts. It is to be built in honor of the dead, but it is to symbolize peace—the fruit of toil, justice, and love. The stages of the shaft carry sculptural suggestions of our three great wars—consummated by a strong symbol of a mighty peace in repose and conscious strength.

The shaft is 401 feet in height, each foot representing one of the honored men whose lives were given for the cause. Elevators will carry visitors to the balcony at the base of the figure. Bells will be hung and rung on patriotic occasions. A softly luminous gold star will shine at night for the joy of the Gold Star Mothers Association, whose sons now shine in a fairer sky than earth's.

The memorial building, just beyond the memorial, is a fitting architectural companion for those that returned, and those organizations that did such helpful work here and abroad. Here a great auditorium is to welcome all expressions of civic and patriotic life. Trophy-rooms, offices, committee-rooms, and all the practical accessories of a noble building are designed for utility as well as for beauty. A symbolic frieze in colored marbles affords the necessary warmth in such a composition on the exterior, while there has been provided great mural paintings in the interior.

From the high ground of the shaft vistas of the park and city stretch away to the east, north, and west. The contemplated cultural buildings are related to the neighboring park, and the civic buildings placed near the station, but as the heart and inspiration of all this life stands the glorification of an aspiring and enduring peace.

PERSPECTIVE.

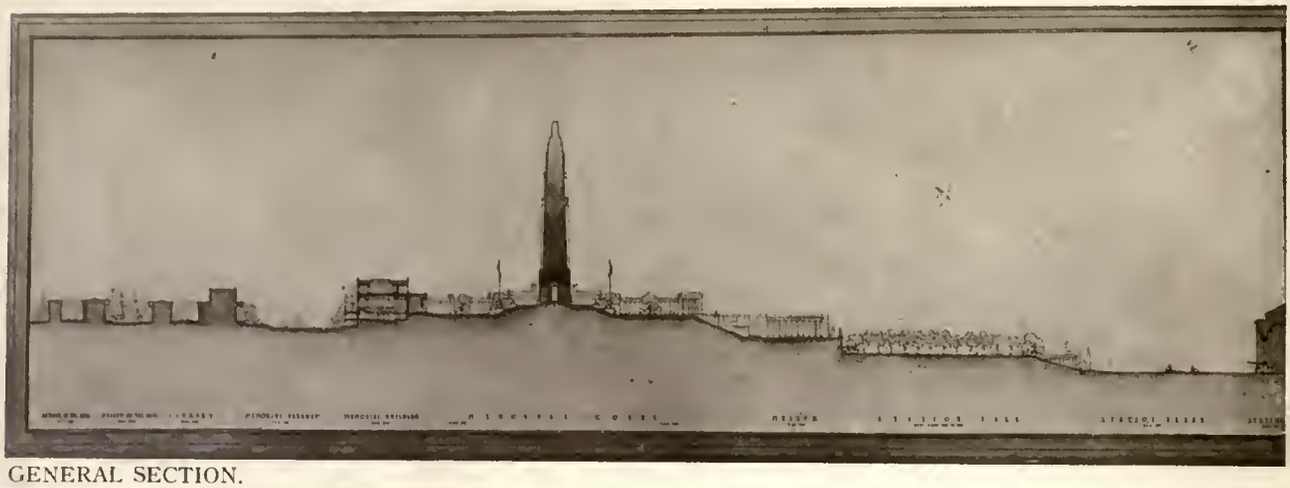


GENERAL PLAN.

Edward Buehler Delk and Armstrong & De Gelleke, Associate Architects.

LIBERTY MEMORIAL, KANSAS CITY, MO. ONE OF THE PRIZE DESIGNS.

PRINCIPAL ELEVATION OF LEGION BUILDING.



GENERAL SECTION.

PRINCIPAL ELEVATION OF MONUMENT.

DETAIL.

LIBERTY MEMORIAL, KANSAS CITY, MO. ONE OF THE PRIZE DESIGNS.

Edward Buehler Delk and Armstrong & De Gelleke, Associate Architects.

Howard Theatre, Atlanta, Ga.

Hentz, Reid & Adler, Architects

PERHAPS no more ideal location for a theatre could have been found in the city of Atlanta than that selected for the Howard Theatre. Located as it is on the most elevated portion of Peachtree Street, directly opposite the junction of Peachtree and Forsyth Streets, it forms a focal point in three directions. Despite the fact that it is only a two-story building it may be seen a considerable distance from all points of approach and can never be cut off from view by any future building operations.

The building has a frontage of ninety feet and six inches on Peachtree Street, and extends back two hundred and fifty-nine feet, which makes it one of the largest buildings in the entire South devoted almost entirely to the exhibition of the motion picture. There is an alley on the south side of the building, and the lot has quite a sharp grade toward the rear, which allows all of the exits on the main floor of the auditorium to be at grade level. The building is of strictly fireproof construction, and has twenty-seven exits. The columns, girders, beams, floor and roof slabs are of reinforced concrete, while the roof trusses and girders supporting the gallery are of steel.

The exterior of the building is designed in the Italian Renaissance of the sixteenth century, and the interior follows both sixteenth and seventeenth century motifs, with a tendency toward the baroque in certain parts. The front on Peachtree Street is of buff Indiana limestone, finished smooth and laid up with joints one-eighth inch wide. The roof over the front portion is of red mission tile. The main entrance to the theatre is through an open loggia, with walls of Indiana limestone and a floor of Napoleon gray marble. From the loggia one enters the main lobby.

This lobby is a monumental room thirty feet wide and fifty feet long, with a vaulted ceiling thirty-one feet above the floor at its highest point. At the end of the main lobby is the grand staircase leading to the promenade and balcony levels. The walls of the lobby up to the level of the promenade floor are of artificial travertine stone, rusticated, with a base of black-and-gold marble. The walls above the level of the promenade floor have pilasters of artificial travertine stone and the intermediate wall surfaces of artificial Caen stone. The floor of the lobby is laid in alternate squares of Belgian black marble and Napoleon gray marble. The ceiling vault is painted blue, and studded with silver and gold stars. The grand staircase has steps of Napoleon gray marble; newels, rails, and balusters are of Breche violette marble. The columns at the head of the grand staircase and at the entrance to the promenade are of artificial Breche violette marble.

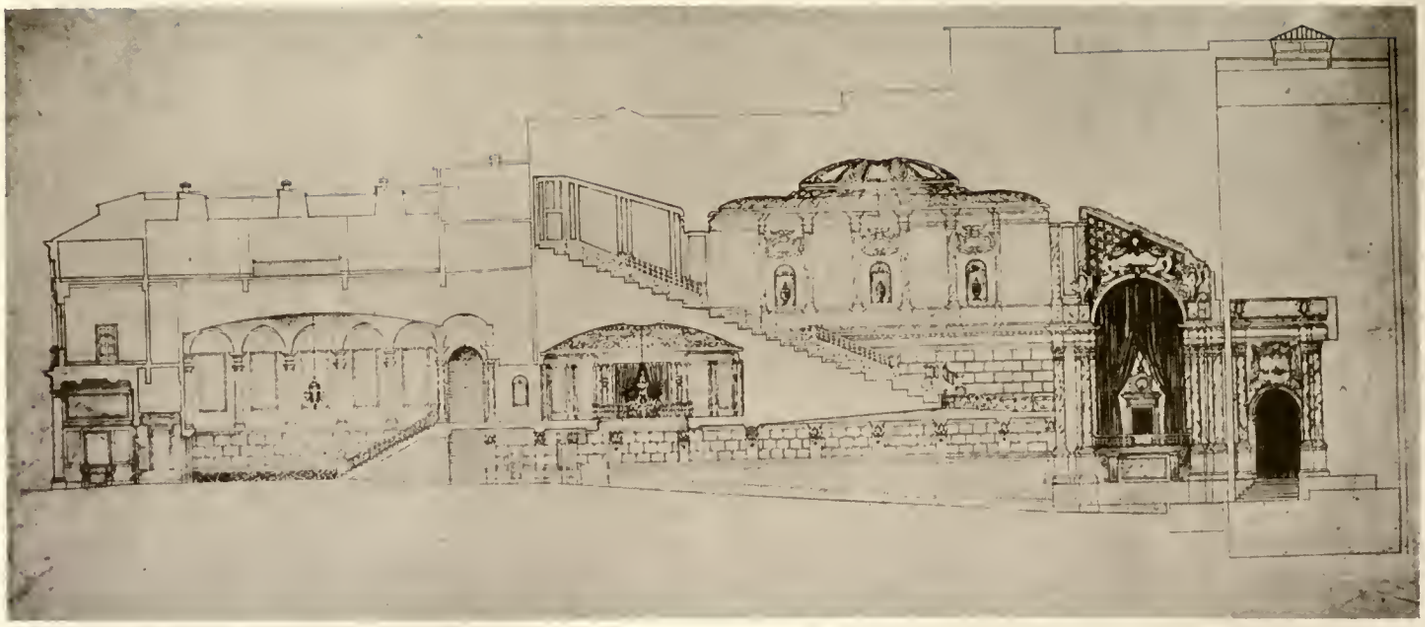
The promenade at the mezzanine floor level is an elliptical room fifty-two feet on its major axis and thirty-eight feet on its minor axis, with an open well in the centre giving a view of the promenade from the main auditorium floor below. The walls of the promenade have Ionic pilasters and engaged Ionic columns of artificial Cippolino marble. The balustrade around the well is of artificial Breche violette marble. The ceiling of the promenade is domed and covered with cartouches and grotesques in low relief. It is painted yellow and then rubbed with silver, the yellow tones showing through the silver. On the wall of the promenade, directly opposite the entrance from the grand staircase, is an eighteenth century Italian tempera painting of an architectural subject, the setting being designed as a part of the architectural treatment of the room. On either side of the promenade are the women's rest-room and the men's smoking-room, with lavatories adjoining. These rooms are designed in the seventeenth century English Renaissance, panelled to the ceiling with heavily ornamented cornices and wood mantels. The smoking-room is finished in dark oak, and the women's rest-room is finished in natural birch.

Particular attention has been paid to the lighting; the central dome has a concealed system of color lighting which consists of red, blue, and amber lights set four inches on centres around the perimeters of the inner and outer domes. The lights are controlled by the dimmers on the switchboard behind the proscenium and give an infinite variety of color changes. The lighting fixtures are from special designs; the lanterns over the boxes and the magnificent crystal chandelier suspended from the ceiling of the promenade are antiques.

The furniture throughout was selected by the architects. The painted benches around the promenade are Italian antiques from the eighteenth century. As a part of the equipment of the building, a three-manual organ with sixty-five stops is installed in the two chambers over the proscenium boxes, with the console located in the orchestra pit.

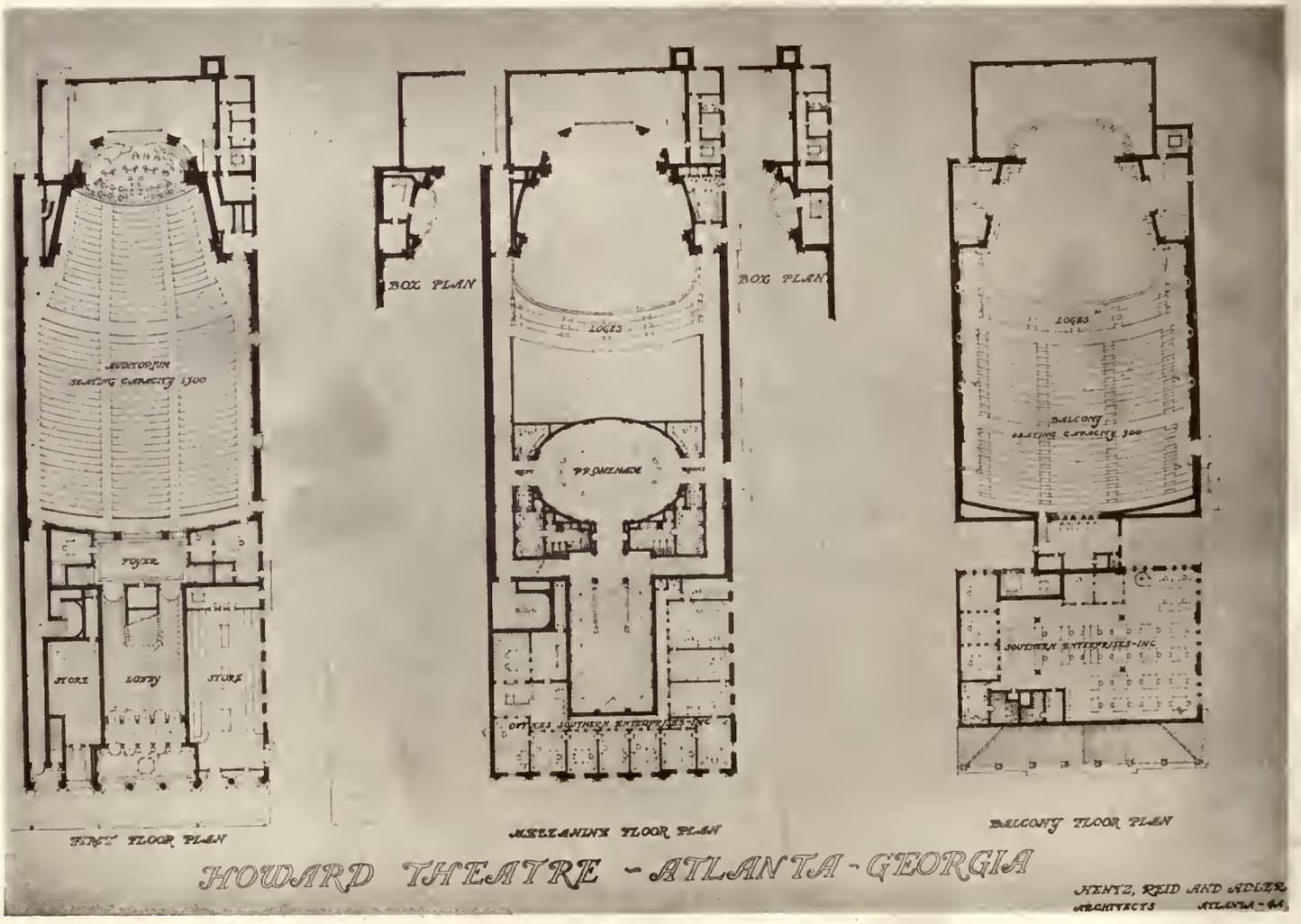
The building has a complete heating and ventilating system, fitted with an air-washer. The main intake and air-washer are located in the penthouse on the roof over the auditorium. The equipment consists of four one-hundred-and-twenty-inch disk-type fans and two ninety-six-inch disk-type fans. In winter the air is forced through the centre section of the air-washer, using two ninety-six-inch fans, blowing the air across the heating coil and into the auditorium through the sounding-board. In summer all six fans are operated, two one-hundred-and-twenty-inch fans and two ninety-six-inch fans forcing air through the sounding-board, and two ninety-six-inch fans blowing down through the coffered segments of the dome. The air is exhausted from the auditorium by a system of mushroom ventilators which are located on the floors of the auditorium and balcony. They are connected with one eighty-four-inch fan located on the roof over the front portion of the building and two sixty-inch fans located under the picture booth in the rear of balcony. The ventilating system for the men's and women's lavatories, the men's smoking-room, and the women's rest-room are on an entirely separate system. The stage is heated by pipe coils, and the entrances, stores, and offices on the second and third floors of the front portion of the building are heated by direct radiation, using a well-known modulation system. The boilers, two in number, are located in the basement under the stage and are of the down-draft fire-box type, one 12,000 square feet and the other 14,000 square feet.

The building is owned jointly by Mr. Troup Howard and the Southern Enterprises, Inc., of Atlanta, Ga.



LONGITUDINAL SECTION.

The main auditorium is entered on either side of the grand staircase. A small foyer with coat-room and offices on either side separate the auditorium from the main lobby. The main auditorium has a seating capacity of fifteen hundred and the balcony seats nine hundred. The auditorium is of a generally ornate character, the ornament being massed around the proscenium and in the central dome. The boxes are two in number, located on either side of the proscenium with a grouping of pilasters and engaged columns on either side which support allegorical figures. The entire motif is surmounted by a large cartouche which is backed by an open grille work that communicates with the organ-chambers located above the boxes. The side walls up to the entablature and the rear wall up to the ceiling under the balcony are of artificial travertine stone with a base of Napoleon gray marble. The general color scheme of the auditorium is green, purple, and gold, with a strong blue note in the sounding-board. The entire scheme is relieved by touches of pure white in the cartouches and in the centre dome.



DETAIL OF PROSCENIUM

The proscenium arch has for its central decoration a large cartouche supported and flanked on either side by allegorical figures. A permanent stage setting surrounds the screen and continues the architectural treatment of the auditorium. The curtain of the proscenium, the hangings of the boxes, and the upholstering of the rails are cloth of gold. The curtains of the permanent stage setting are of purple velvet.

REST ROOM.

MEN'S SMOKING-ROOM.

HOWARD THEATRE, ATLANTA, GA.
Hentz, Reid & Adler, Architects.

Heat Retardants in Relation to Architecture

By John E. Starr

IN these times of high coal prices it is well to pay increased attention to heating costs and methods of keeping them down.

In the Northwest, in such places as Minnesota, Dakota, and Saskatchewan, the necessities of cold weather, long continued, have for years inclined the mind to follow this subject closely, and there are those who make a specialty of household heat conservation.

If our climate were continuously at a temperature of about 72° or 74° F. and the winds did not blow, and were all human beings honest, and if privacy was not sought, we should need no walls to our dwellings. We build for privacy, safety of property and life, and protection against the moving air, but the main reason for the existence of walls lies in the desire to preserve the comfort and safety of persons from the climatic changes of heat. Hence a study of heat transfers increases in importance as the cost of producing heat increases.

Heat once produced flows from a warm body to a cold one with a velocity directly in proportion to the "heat head" or difference of mean temperature on one side and the mean temperature of the other. If the temperature in a room be 72° and of the outside 20°, the heat head is said to be 52°. It will flow from 72° to 10° at a heat head of 62°, or 19½ per cent faster. A wall is placed between the high and the low temperature as a retardant of the rate of heat flow. It can never act as a perfect stop of flow, but means can be taken to retard the flow, and therefore the cost of producing heat to a point where the saving in cost of supplying the heat and the fixed charge on the retardant structure will be somewhere near equal.

The structure to retard heat that is included in a simple partition to exclude moving air and for reasons of safety of property and privacy of person is called "insulation" (meaning, of course, heat insulation), and the effort of the architect should be to produce an economic balance between the cost of insulation and the cost of producing heat.

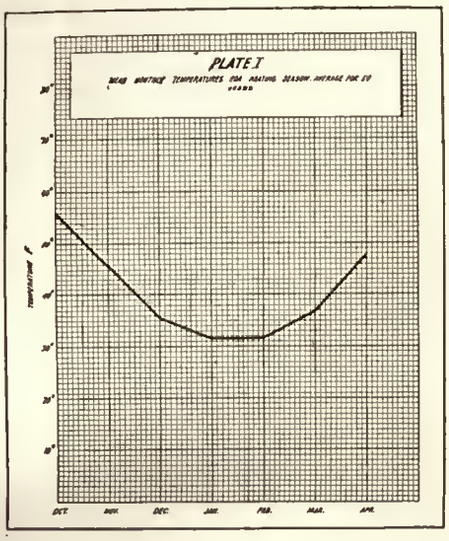
It is not difficult to establish some of the elements of the problem. The main averages as to the distribution of load are easily ascertained, as the factors are pretty fairly well known. A figure of say 72° or 74° may be taken as the datum for inside temperature, and as this factor is fixed, the more varying factor of outside temperature is available, and of record on the average. The government of the United States through the Weather Bureau has for years kept a record of mean monthly temperature, and with a fixed inside required temperature for a datum, it follows that the load must vary with the variations of the outside factor, and the load will be on the average in proportion to the mean monthly temperature. By subtracting from (say) 72° the mean monthly temperature of each month of the cold season we arrive at the distribution of the load for the season by months on the average. The mean monthly temperatures for the latitude of New York for nearly fifty years have been as follows: October 56°, November 46°, December 36°, January 32°, February 32°, March 37°, April 48° (see Plate I). The use of fuel is represented on Plate II. Subtracting the mean monthly temperature figures from 72 and arranging a curve expressed in percentage of the whole use of heat for the season, we arrive at the results shown in Plate III. It is a fact that the percentage of use of coal for the entire season is very close to the above per cent of mean difference between 72 and the monthly mean. So close is it, in fact, that it may be commercially relied upon. To show how commercially the mean difference between 72 and the mean monthly temperature may be relied upon, a curve was actually plotted in Baltimore, where a goodly sized central steam plant had been in existence for some years. The average of the mean monthly temperatures for some years was plotted and the income per degree of difference established. An unusually cold December came on, and by applying the monthly mean as shown to December 27, the income for the month was predicted within one-quarter of one per cent of accuracy. The few days lacking made no appreciable difference in the monthly averages, as it turned out.

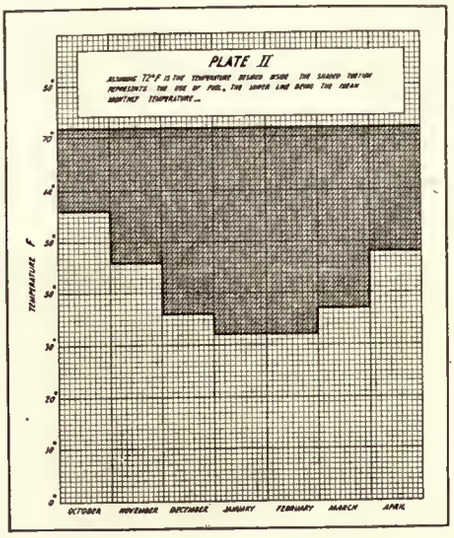
While the distribution of the load throughout the year may thus be accurately predicted on the average, it is impossible to figure in advance the total amount that will be used in any one year. For example, in the unusually cold season of 1918–19 (the coldest in forty-seven years), the demand for heat as shown by the above method was found to be 23 per cent more than it had been in the average of forty-seven years. Everybody, including the government, the railroads, and the coal barons, was blamed by a shivering populace for a shortage of coal. As it happened, no one was to blame but Dame Nature, for no one could foretell that the demand would be 23 per cent more than the average, and our coal-producers and railroads were only equipped as to production and distribution for the average; and forty-seven years seems a period long enough to judge by! It would not pay to add 23 per cent to coal-breakers, coal storage, coal-cars, etc., to provide for an event that might not occur in another forty-seven years. Local consumers would never bear the burden of insurance by providing local store to cover such a remote eventuality. So it is probable that if the season 1918–19 is ever repeated, we shall have to shiver as before.

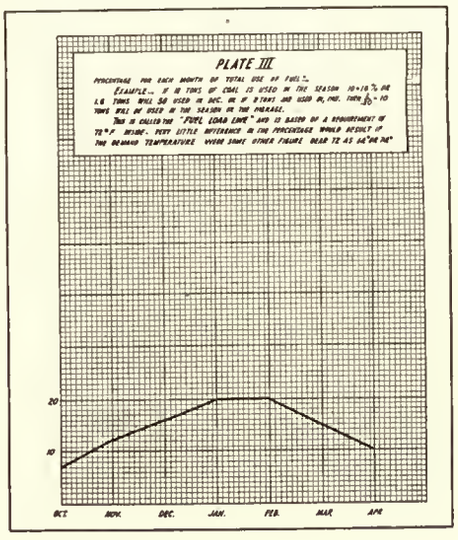
It is, perhaps, useless to try to educate the small heat-producer, such as a householder or his servants, to a more economical method of originally producing heat. It is probable that less than 50 per cent of the heat that should be gotten from the combustion of coal or wood is made available by the average householder, through non-burned fuel (coal in the ash), imperfect admixture of the elements of ordinary combustion (carbon and oxygen), waste hot gases, improper admission of cold air, etc. Of the 13,000 or 14,000 B. t. u.'s* of heat that result from just the right union of combustibles, a large user with the most complete appliances for producing such a combination and testing his results

* NOTE.—A B. t. u. (British thermal unit) is in this country the legal and ordinary unit of the amount of heat necessary to add to one pound of water to raise it 1° F. in temperature, or the amount of heat necessary to take out of 1 pound of water to lower it 1° F. Thus, 1 pound of water 1° is 1 B. t. u. One pound of water raised or lowered 10° takes 10 B. t. u.; 10 pounds of water raised or lowered 1° adds or subtracts 10 B. t. u.; 20 pounds of water raised or lowered 2° requires addition or subtraction of 40 B. t. u.; 10 pounds of water changed 5° takes 50 B. t. u., and so on.

In many countries, notably in France and Germany and in the scientific world generally, a so-called "calorie" is taken as a unit, or 1 kilogram of water 1° Centigrade. A calorie represents about four times as much heat in quantity as a B. t. u., but a calorie per kg. is 1.8 times a B. t. u. per pound, as a Centigrade degree is nine-fifths of a Fahrenheit degree.







considers himself fortunate if he puts 73 per cent, or 9,500 to 10,250 B. t. u.'s, to actual final work, and the small user, with his comparatively incomplete apparatus, cannot be expected to do anywhere near so well. So little can be expected as to the average economic gain from improved apparatus and method. But admitting that the loss in this direction is and will continue to be large, it is quite possible to save a considerable portion of the heat once (admittedly uneconomically) produced, that would otherwise be lost, as far as human benefit is concerned.

The ordinary brick wall, 12 inches thick, plastered inside, will transmit heat from the warm inside to the cold outside at the rate of about 7½ B. t. u. per degree of difference per square feet per day.

The mean of the outside for January as shown is 32°, or a difference of 40°. If an average of 72° inside is required:

$$40 \times 7.5 = 300 \text{ B. t. u. per day.}$$

Say, the house exposes 2,000 square feet:

$$2{,}000 \times 300 = 600{,}000 \text{ B. t. u.}$$

The average housekeeper probably does not realize over 7,000 B. t. u. from a pound of coal.

$\frac{600{,}000}{7000} = 86$ pounds of coal, or for 30 days, 2,580 pounds in January or February.

As is shown on Plate III, the coldest month on the average is about 20 per cent of the whole season, so $\frac{2580}{.20} =$ 12,900 pounds or $6\frac{45}{100}$ tons for the season for this item only.

Now, an inch of any good insulating board will only allow about 6.4 B. t. u. to pass per square foot per degree of difference.

The reciprocal of the sum of the reciprocals of an insulation closely approximates the conduction of the two combined. $\frac{1}{7.1} + \frac{1}{6.4} = .1335 + .156 = .2895$, and the reciprocal of .2895 is 3.6 B. t. u., which is the amount of heat that a 12-inch brick wall with a facing of a good insulating board, plastered, will allow to pass.

$$\frac{3.6 \text{ B. t. u.} \times 2000 \text{ square feet} \times 40° \text{ difference}}{7000} = 41.14$$

pounds per day.

$41.4 \times 30 = 1234.2$ pounds coal per month.

$\frac{1234.2}{.2} = 6{,}171$ pounds for the season.

$\frac{6171}{2000} = 3.0855$ tons for the season, showing that the insulation has reduced the coal bill on the supposed building as to heat transfer alone from 6.45 tons to 3.0855 tons, or with coal at $15 per ton the saving would be $46.32, or the interest at 6 per cent on $772, which is more than the cost of our 2,000 feet of insulation.

In addition to the actual saving in money as shown, there is an additional value that cannot be expressed in dollars, which includes the additional comfort at all times in the cold season, the security against "peaks" of extreme cold, and the comfort of a cooler house in the warm season.

Much can be done also in the way of protection against the sun's rays. Heat is warded off, especially at high temperatures, or is "radiated" by color alone. A test was made on a roof of a building when the thermometer showed 90° in the shade. When the sun was shining a thermometer on a black roof showed 130° F. By simply rolling the thermometer a few inches so that the bulb came on the top of a white piece of paper laid on the roof it promptly dropped to 116°, showing a drop in the heat head of 14°, and, as shown above, the heat head is the governing factor; and assuming 90° was the inside temperature desired, the same as the outside, the saving shown by the white surface was as 130–90 is to 116–90, or 20 to 13, or nearly 2 to 1, while the sun was shining, as to all surfaces exposed to the sun's rays. In one case a combination of roof insulation and color made all the difference between the tenability and the untenability of an upper story for office purposes in a large factory, and gave the use of many square feet of desirable office space, which would otherwise have been useless for that purpose.

Something can be done with lighting in connection with the effect of heat. Window surface varies greatly, but may average about 26 per cent in dwellings with all outside exposure, and is therefore a large item. A single-pane window will transmit about 24 B. t. u. per degree of difference per day, while a double window will transmit only about 11.4 B. t. u. per day. Hence the window area will require the use of more coal if it is a single pane than if it were a double pane.

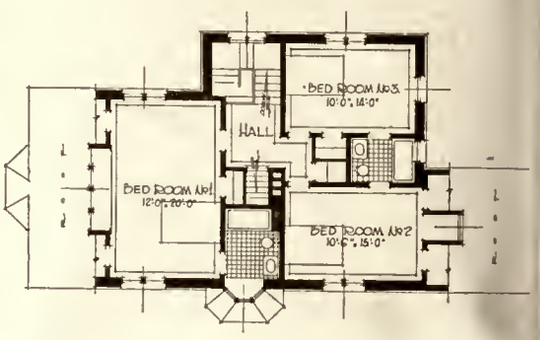
No account was taken of window area in the above example, but simple arithmetic shows that if 26 per cent of our supposed 2,000 square feet were window area, the coal consumption would average 9.457 tons for plain building and with single-pane windows, and only 5.8458 tons for insulated building and with double-pane windows. This is 4.6112 tons coal saved, which at $15 per ton would make all told a saving of $69.16 per year, or the interest on $1,152.66 at 6 per cent, which would more than pay for the insulation and double paning of the windows.

It may be said here that a 12-inch average brick wall and the usual inside finish is about equal to the usual wooden wall, one layer of paper and lath and plaster inside finish, as far as heat transmission is concerned.

Much can be said of wind velocities and other matters affecting heat transfers, but the broad principles are indicated above.

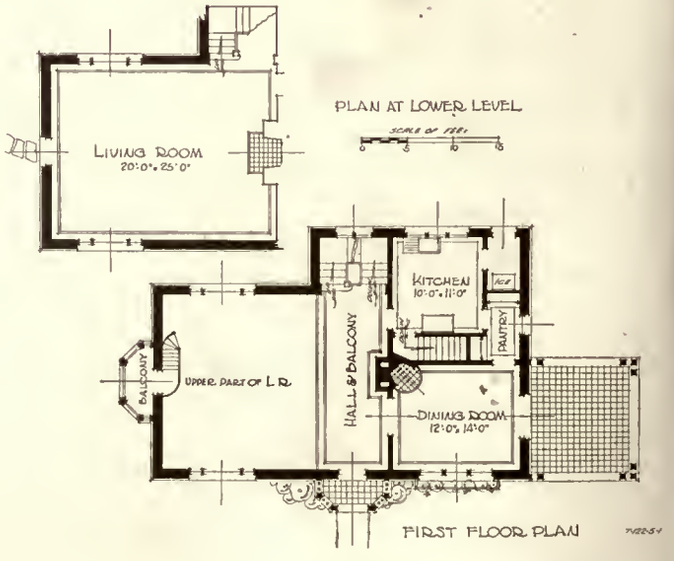
These remarks are made from the standpoint of one who has spent his life in fighting the influx of heat into buildings, as in cold storage, and removing such heat as came in with the goods, but it would seem that the general principles are the same as in keeping down the efflux of heat.

The inevitable results of being obliged to take in heat or give it out for ventilating purposes have to be considered in both cases.



SECOND FLOOR PLAN

STUDIO - LIVING ROOM



PLAN AT LOWER LEVEL

FIRST FLOOR PLAN

HOUSE AND PLANS, C. RUTLEDGE AGNEW, TENAFLY, N. J. R. C. Hunter & Bro., Architects.

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ARCHITECTVRE

·THE· PROFESSIONAL · ARCHITECTVRAL · MONTHLY·

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THE HARKNESS MEMORIAL TOWER, HARKNESS MEMORIAL QUADRANGLE,
YALE UNIVERSITY

ARCHITECTVRE
THE PROFESSIONAL ARCHITECTVRAL MONTHLY
VOL. XLIV OCTOBER, 1921 NO. 4

The Harkness Memorial Quadrangle, Yale University

The Architectural Plan*

By James Gamble Rogers, '89
Architect of the Quadrangle

IN studying the details of as large an operation as the Memorial Quadrangle, with its primal need of open spaces for air and light, it was first necessary to decide on a few general principles, such as the general effect, location of entrances, style of architecture, kind of trim, kind of field, size of rooms, character of construction, circulation, stairways, and hallways.

Preliminary sketch.

As this was to be a group of dormitories only, it seemed fitting that the general effect should be entirely residential, and as far as possible free from the blighting aspects of the conventional institutional or barracks-like structures.

To accomplish this to the greatest advantage, it first seemed necessary to introduce a number of small courts and to make all the buildings low, but this was found to be impossible because of the fact that one of the requirements was for the housing of at least a certain large number of students. No arrangement of small courts which would be of sufficient size and yet not appear cramped would give us anything like the number of rooms required.

The solution was found in a compromise of this principle; in making some small courts with low buildings around them, and some larger courts with high buildings; from this arrangement there eventually resulted the accepted group of six courts. To take full advantage of the sunlight, three smaller courts with low buildings will be placed on the southern (Library Street) end of the block, and two on the northern (Elm Street) end, with higher buildings and the largest court, or campus, in the middle, running through from east to west. The three small Library Street courts will be somewhat larger than the court of Wright Hall, but the buildings surrounding them lower, thus securing, I feel sure, sufficient air and light. The two northern (Elm Street) courts are wider than the court of Berkeley Oval. The main court, or campus, is about 150 feet wide and 260 feet long.

THE SIX COURTS

Then, to get the fullest advantage of the southern sun, the buildings at the southern (Library Street) end of the block will be made low, the remaining buildings increasing in height toward the north across the group.

In order to allow the sunshine to enter as much as possible into the different courts, the buildings running east and west, from High to York Streets, are kept proportionately much lower than the others; here and there the roof is slanted a story lower on the north side to facilitate just that much more the greatly desired admission of all the sunlight possible.

As Yale has no well-defined general plan of the university to be followed, and therefore no definite main entrance, there is the difficulty of how to make entrances that will prove the most serviceable in the future. The principal entrance will be from the old campus side, on High Street, at a point opposite the present space between the Old Li-

THE ENTRANCES

Livingston Gateway and windows of Trumbull.

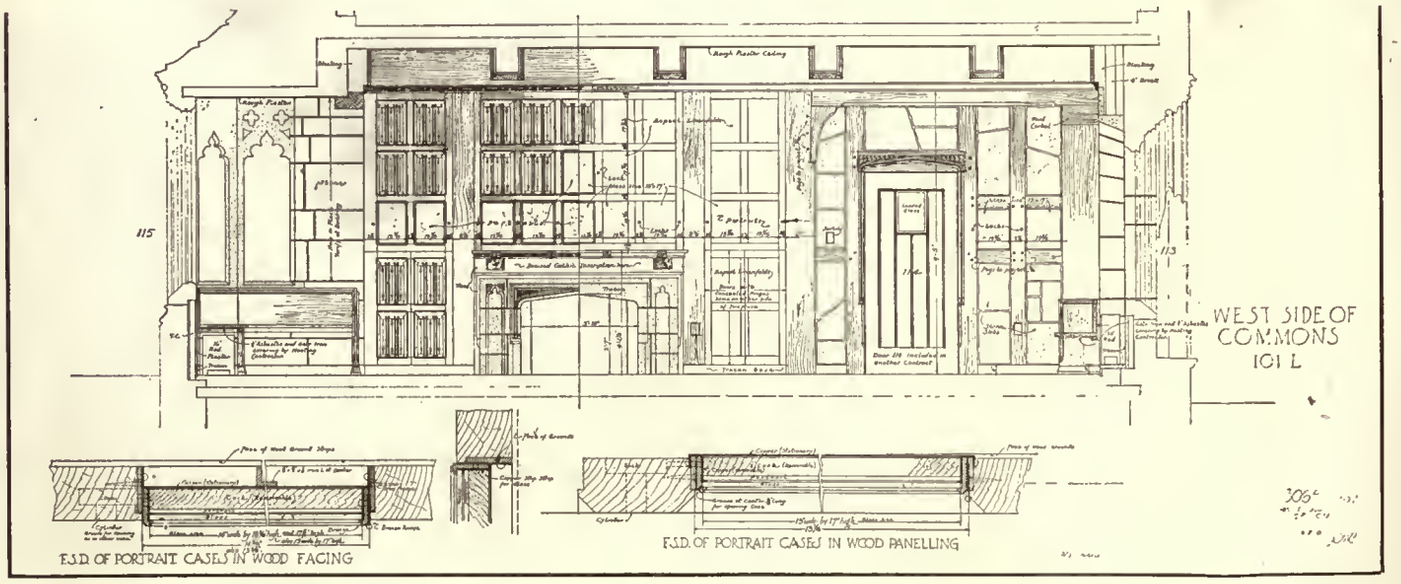
* From the address by Mr. Rogers when formally showing the university the model and drawings for the group of buildings.

The model of the Quadrangle.

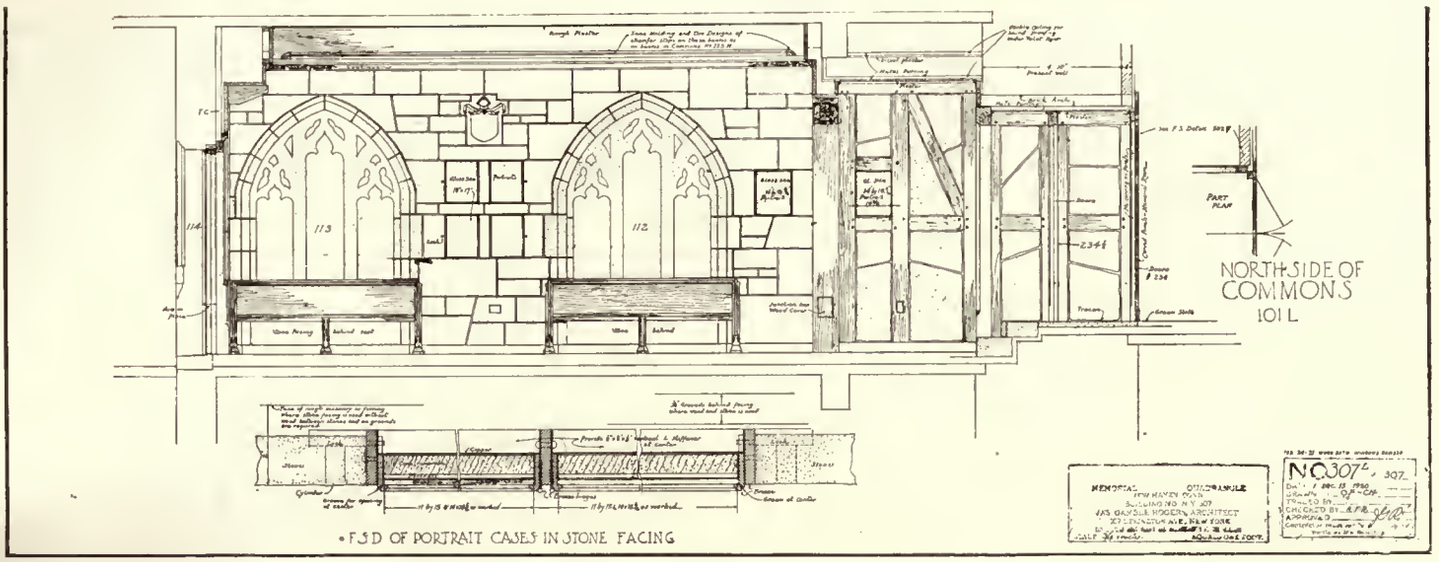
brary and Dwight Hall. This entrance will be marked by the Harkness Tower and will open directly into a large court, or campus, giving an impressive effect through the central group on the north side and a picturesque view of the secondary tower that marks the termination of this court and counterbalances with the proper dissymmetry the Harkness Tower.

There are to be five other entrances, arranged not only for what seems the most probable use required of them now and in the future, but with the idea of also obtaining the best effect of the vistas. There will be six entrances in all: two on Elm Street, one on York Street, two on Library Street, and one on High Street. To prevent the too easy access to the rooms by possible sneak-thieves from the city streets, there is to be a wall around the whole group, and between this wall and the buildings there will be a sunken area, about four feet deep, which we hope will make it impossible for any one to enter the buildings except by the regular entrances.

(*Continued on page* 290)



Details of Trumbull Commons.



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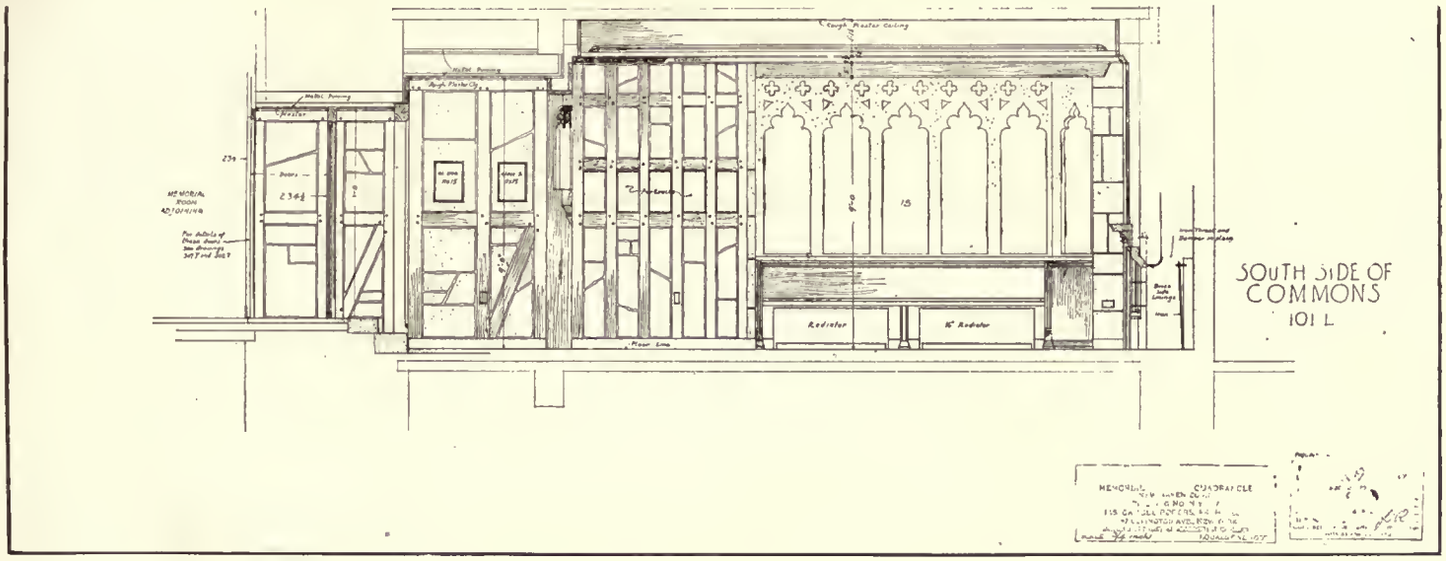
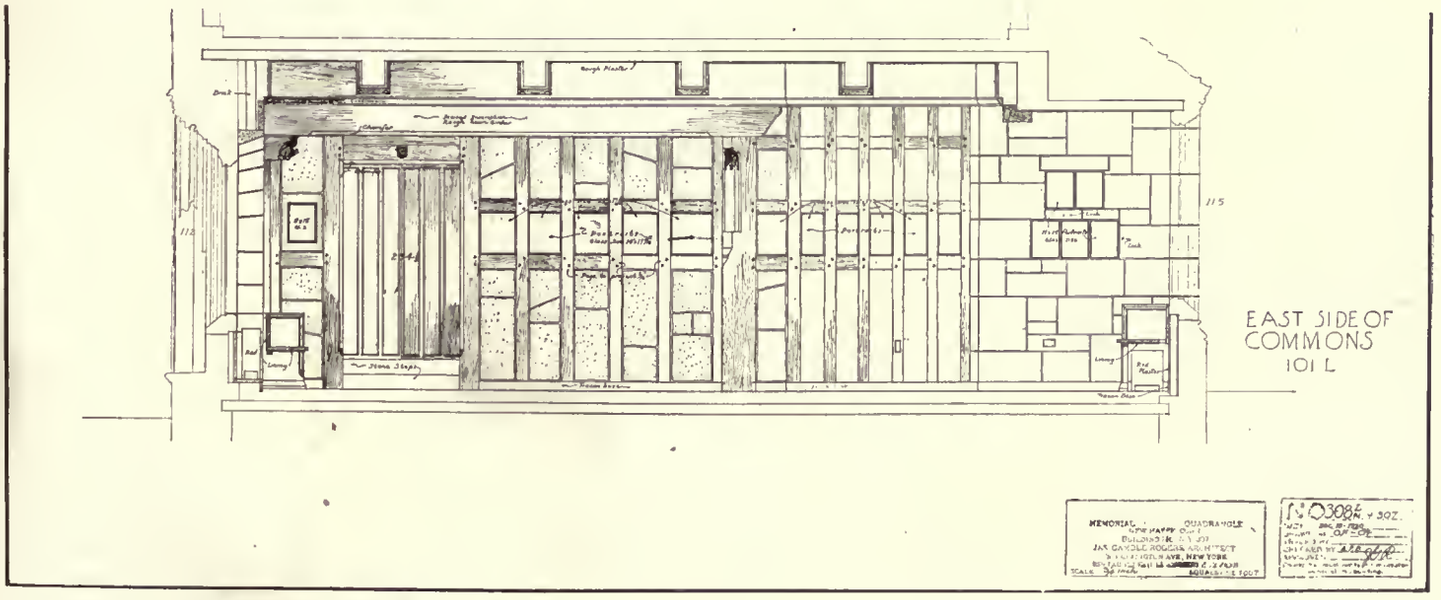
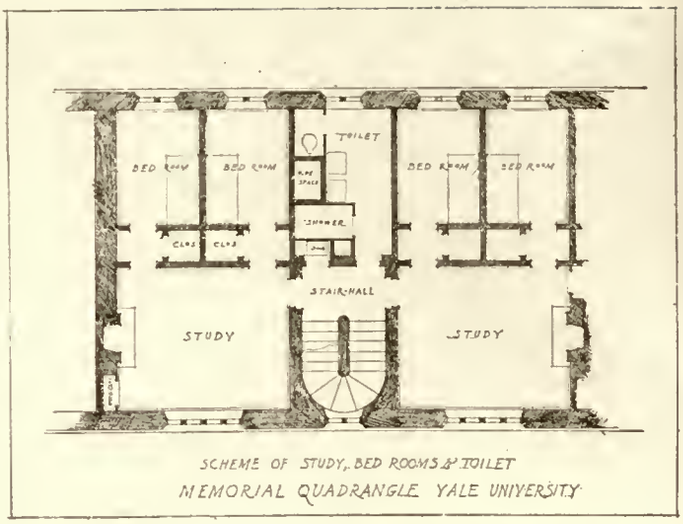




DETAILS OF TRUMBULL COMMONS.

Study for Commons.



(*Continued from page* 288.)

The university asked that the group be in the collegiate Gothic style of architecture—a good choice and a wise plan; and there was no sufficient reason for not making the buildings in that style. But as determining the style by no means determines the kind of material to be used, there was a large question open for study as to the kind of stone trim and field.

THE STYLE AND STONEWORK

Not from sentimental reasons, but purely to secure an effect of beauty, I determined at the start to endeavor to make the walls like the stone of some of the little islands between Saybrook and New London as they look in the afternoon when the sun shines on them. This, I felt, would give a warmth and cheerfulness that is so much needed during the season that the students are at New Haven. This particular stone, however, was not only impossible to get but was unsuitable to handle. But at any rate it was a definite idea to go upon, and it determined, in a way, the color that was wanted and therefore determined the kind of trimming stone that we should have.

A French stone answered this purpose because of its color and texture and durability—for centuries of exposure in building constructions abroad had shown that weather and wind had no other effect on it than apparently to make it a little harder. The location of these quarries, however, was so near the trenches, and the possibility of delays in shipping made it such a tremendous undertaking, that we had to abandon its use.

However, thoroughly searching the country—and I think I can truthfully say this, for we have had samples from Texas, Georgia, Colorado, Missouri, Kentucky, Wisconsin, Minnesota, Virginia, Ohio, Indiana, Connecticut, New Jersey, Massachusetts, Idaho, Alabama, North Carolina, Tennessee, and several other States that I have forgotten—we finally procured a stone that very nearly approximates the first ideal.

Study for meeting-room.

The size of the rooms was determined after a comparison with the usual college rooms; the dimensions chosen will be large enough for comfort and convenience, without being unnecessarily large and therefore reducing the number of rooms that could go in the space. For it is, of course, of the greatest importance that the number of rooms be as great as possible; that there be no waste of space and nothing so large that the care and upkeep will be out of proportion.

THE ROOMS

There are twelve hundred and sixty-six rooms in the entire group. These are arranged to house six hundred and thirty students. Generally they will be in the form of a study with two bedrooms. To accommodate the various requirements of the student, there are about one hundred and thirty single rooms and a number of suites of one study and a single bedroom. There are some groups of one study and three bedrooms. There are one hundred and sixty toilet-rooms in the whole group.

The studies are to be approximately fourteen feet square, and the bedrooms about eight by eleven feet. Single rooms have about one hundred and fifty square feet of floor area, though the dimensions are varied considerably in order to give a greater feeling of individuality to each room and to utilize the space to the best advantage.

The kind of construction chosen will be masonry walls and reinforced-concrete floors and columns, this being considered the best for dur-

Painted decorations on windows.

ability and protection. But the details are studied in such a way as not alone to secure fire protection but to insure the minimum of upkeep. The entry system was adopted without much discussion, and its many advantages for safety and convenience were so apparent that it was considered almost settled from the first. The stairs are as nearly fireproof as can be made, being of stone with an iron hand-rail and without any trim to the doors opening on stairs. The stairs are to be built in the old-fashioned way, the step being of a solid piece of stone supported by the masonry wall at each end.

THE GENERAL CONSTRUCTION

There are some interesting details about the planning of this great Yale group and the handling of the whole building operation wherein they differ from the general practice. Some might call this unbusinesslike, but wrongly, for it is one of those cases where I think the ideal will prove the most businesslike.

SOME GENERAL CONSIDERATIONS

We are starting this building without knowing the cost. We do not know the final cost, but we do know that when we get in our bids for each trade we shall have that item complete and definite and therefore can get a more intelligent estimate than could be gotten should we take our bids before all the full-size details are made and every item determined on. This gives us the great advantage of being able, during the long time of putting in the foundations, to fully study the exact kind of mouldings and to make those ornamentation changes, improvements, and economies that come only from long study and care.

Leaded windows in Cabinet Commons.

In order to get satisfactorily the stone jointing, texture, color, and mortar, we have had eight different walls built in New York City. When we obtained one that seemed correct, we had a larger one built in New Haven, where it could be studied in the same light and under the same conditions as will affect the permanent buildings. All this preliminary study costs money, but it is not extravagant nor wasteful, because it will in the end save many times the amount expended. We have already found that we can accomplish results in the kind of mortar used, and a saving that will more than equal the cost of all these preliminary operations. If, in addition, from knowing exactly what to do, we can make a slight saving in speed and avoid delays, the total saving will amount to considerable. For you must realize that there is a vast amount of these exterior walls. To give you an idea, I will state that the exterior wall surface alone just about equals a wall higher than the average house and one mile long.

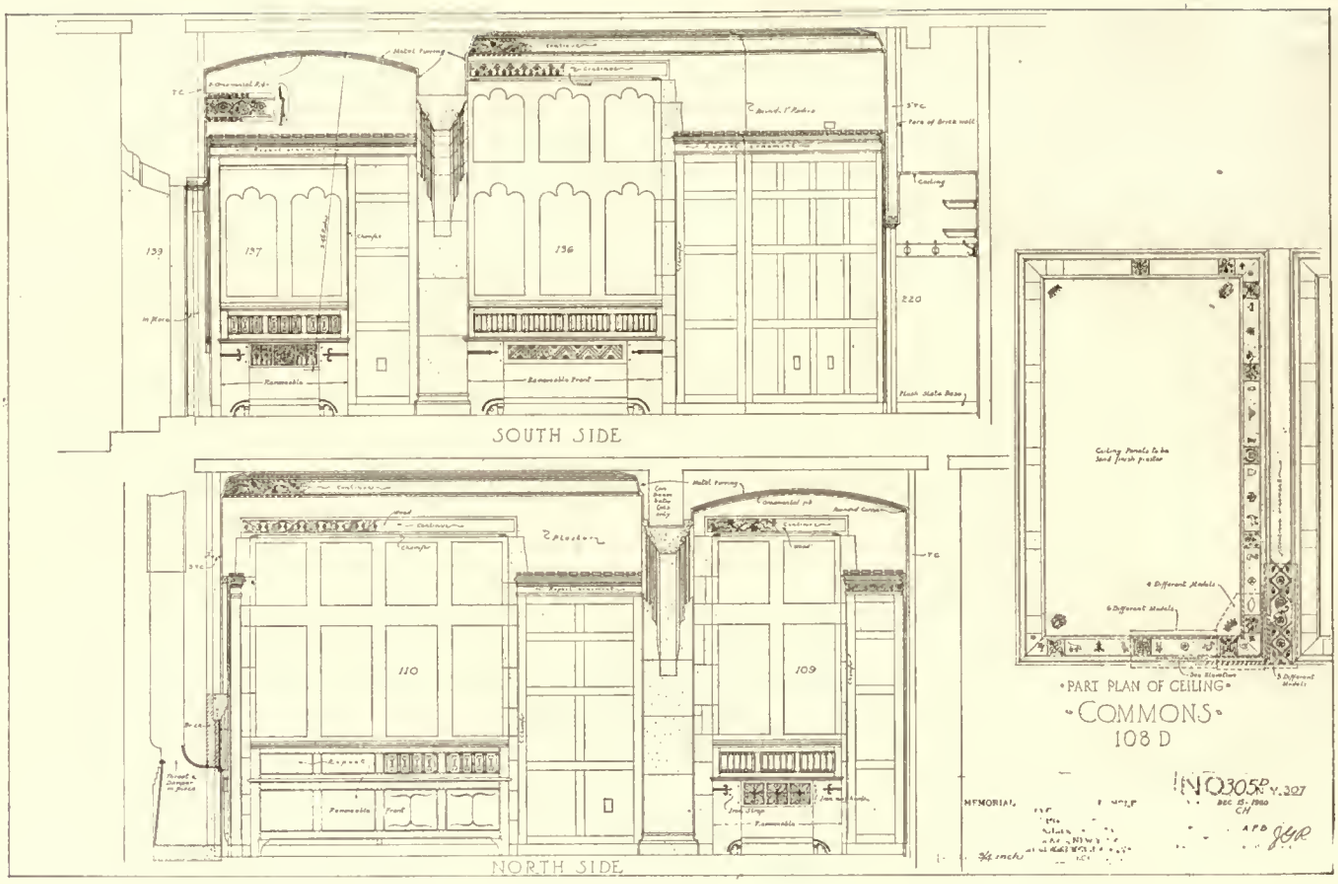
A preliminary sketch.

Another difference from the usual procedure of architectural operations was the way the plan was made. Instead of asking the university for various and numerous requirements, I asked only for the size of the lot and the number of rooms required, and then began a careful plan of what should go in such a building. After this I received from time to time requests for different things all of which I think have been incorporated. Only recently Mr. Stokes expressed the wish that we might in some way have a suggestion of Wrexham Church Tower, where Elihu Yale was buried. We readily changed one of the towers to Wrexham and in return asked him to get one of the stones from Wrexham Tower which would be built into our tower, thus tying the bond just that much closer. This is especially fortunate, for in many of its details and in its spirit it harmonizes with the main tower, the Harkness Tower.

The Harkness Tower is not another tower like the Magdalen Tower at Oxford; there are so many Magdalen towers in our universities, schools, engine-houses, and jails that we decided to avoid it if possible, and therefore on the Harkness Tower we have designed a "Couronne" tower as it has been shown in a very thin sort of a way in Saint Botolph in Boston, England, and in other towers abroad in a more substantial and dignified manner.

It is a sentiment that will appeal to all Yale men to have had the corner-stone laying for the Memorial Quadrangle on the two hundredth anniversary of the starting of the first building on the New Haven campus. In the foundation for the corner-stone are bricks and stones from the old buildings that were on the site of the Memorial Quadrangle.

There are numerous refinements, I mean old Gothic refinements, that prevent a factory-made appearance, which I think are more of an architectural study and not so suited to this article.



DETAILS OF LYCEUM COMMONS.

The Memorial Quadrangle of Yale University and the Harkness Memorial Tower

By George Nichols

King Entry, Branford Court.

WITH the completion of this new dormitory group, occupying an entire city square, and providing quarters for over 600 men, Yale College reaches the fulfilment of her long-cherished plan to house all of her growing body of students in campus rooms. The buildings are the gift of Mrs. Stephen V. Harkness, and the great tower, which is the architectural climax of the group, constitutes a memorial to her son, Charles William Harkness, a graduate from Yale in 1883, who died in May, 1916. The Quadrangle has been made a memorial to Yale's illustrious sons and to her historic past. The gateways are named for those leaders of early colonial life whose activities resulted in the establishment of "the Collegiate School" and its development into Yale College. The several towns where the college was founded and first conducted are recalled by the designations of the larger courts, while the thirty-seven entry doorways bear the names of distinguished graduates and mention of their achievements. Everywhere enshrined in ornament, inscription, and sculpture are the records of inspiring lives and noble deeds. Historic fact and mysterious legend, boyish fancies, song and jest, alike embellish the fabric and perpetuate the ideals and traditions of Yale.

The architect, James Gamble Rogers, himself a Yale man of the class of 1889, has been given an opportunity for architectural expression such as comes to few men. The success with which he has fulfilled the practical, artistic, and æsthetic demands of his commission becomes more and more impressive as the great Quad draws near to final completion.

What the architect's mental processes were at the outset was sympathetically reported to his expectant readers by Edwin Oviatt, editor of *The Yale Alumni Weekly*, while plans were taking shape, as follows:

"The problem was how to meet the requirements of a dormitory group in the Gothic style that would house over 500 Yale undergraduates on the entry system, which would fit into the feeling of the place and yet strike its own commanding note, but which, if that note was to be of the English college, should avoid the mechanical repetitions into which so many modern attempts at Gothic seem to fall. At one stroke there had to be secured something of that indefinable charm which the Oxford Colleges have gained only through centuries of weathering, and of successive buildings on original lines." Comparing the new Quadrangle with the old campus group, Mr. Oviatt said:

THE PROBLEM

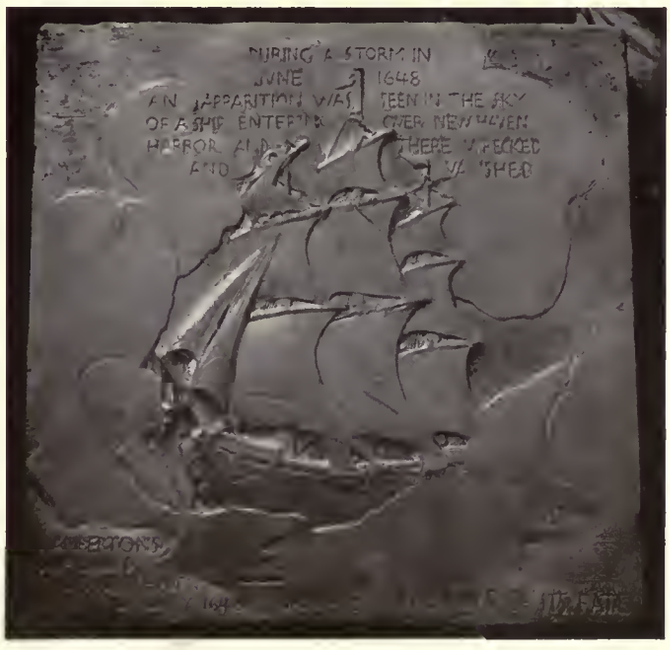
"The new Yale rising across High Street will be a more beautiful, a more intimate and lovable place—a retreat of courts and towers, entries and walks, of old English doorways and gables and Gothic windows—establishing, we may hope, in New Haven those ancient college quads which John Davenport knew at Magdalen and Merton and Brasenose, but which his successors in the building of the college he dreamed of have not until now brought to New England."

Mr. Rogers has said that first of all his desire was to make the buildings truly livable, and that with livableness should go cheerfulness, picturesqueness, and inspiration. The fact that architecture may minister to more than material needs was fittingly expressed by President Hadley, in his address of acceptance at the laying of the corner-stone, on October 8, 1917, when he said:

"A university is something more than a school, or group of schools. It is a complex of traditions and influences; of sentiments inherited from the past, and aspirations reaching out into the future. The lessons learned in its classrooms and laboratories constitute but a small part of the education which it offers. The students are taught and inspired by the example of those who have gone before them, and by the interests and ambitions of those that are about them. They breathe the spirit of the place. . . . Of the various means to develop and perpetuate this spiritual side of education beautiful buildings are one of the most important. . . . A monumental building, if it be really beautiful and glorious, gives a visible and permanent object round which life and loyalty can grow, and to which tradition and sentiment can attach."

Almost before the design had taken definite shape consideration was given to choice of materials. Connecticut brownstone held no charm for one who had spent four years among the sombre buildings of the old Yale Campus. There must be secured an enduring stone which would lend as much warmth and cheerful color as possible during the dark and

THE STONE



The Mystery ship.

stormy winter months, in which the buildings were to be most used. Mr. Rogers had long admired the golden brown of the rocks washed by the surf and glowing in the sunlight along the shore of the Sound near his summer home. While this particular stone was unsuitable for building purposes, there was found in the seam-faced granite of the Plymouth Quarries, along with the predominating golden browns desired, a wealth of other harmonious colors, which bring to the buildings an added and unusual charm. One enthusiastic admirer says of it: "And the quality of the stone! Who, I wonder, first thought of that stone? The warm rich color, the irregularities of its surface, its ease and geniality, remind one of the cheerful pattern of a homespun suit, whose idiosyncrasies, instead of being flattened, are emphasized." For trimmings the yellow, rust-veined Briar Hill sandstone was chosen, in friendly harmony with insuring abundant natural ventilation. Each entry, with its rooms on either side, is separated from the next entry group by fire-walls, extending from basement to roof. Toilet facilities for the adjacent rooms are provided on each entry stair-landing. The fire-escape problem is solved by fireproof passages through the attics, connecting one stairway with another, automatic fire-doors occurring midway in each passage.

The junctions of the various building units, with the accompanying necessity for appropriate emphasis in mass, the occurrence of entries and stair halls at certain required points, and the piercing of the units by the passages giving access and circulation have been cleverly availed of to secure numerous and interesting diversities in the plan and arrangement of the various suites.

The subdivision of the buildings and their grouping

Elihu Yale. Jonathan Edwards. S. F. B. Morse. James Fenimore Cooper. Eli Whitney.

SOME OF THE SCULPTURE ON THE HARKNESS MEMORIAL TOWER.

the granite in color and amenable to the carved intricacies of Gothic ornament. More will be said later of the wealth of harmonious color which the buildings possess, but as these fundamental materials were selected at the very beginnings of design, and play such an important part in the picture, they are mentioned prior to a consideration of planning and grouping.

ROOM AND BUILDING UNITS

It is not difficult to conceive what dreary monotony would have resulted from a commonplace, unimaginative treatment of buildings composed of nearly eleven hundred small rooms. But notwithstanding the absence of large rooms or halls, which would establish main points of interest and form a basis for architectural grouping, there have been built up from the required small units a surprising number of pleasing compositions of dominant and subordinate masses, contrasting in outline and varied in detail. Every possible artifice in design has been employed to impart a definite and appropriate character to each part of a harmonious and picturesque whole.

The general arrangement of rooms is on the entry system, and the resulting units which surround the seven interior courts are of such width that the suites, consisting generally of a study and one to three bedrooms, extend through from street to court, or from court to court, thus

GROUPING OF BUILDINGS, COURTS, TOWERS

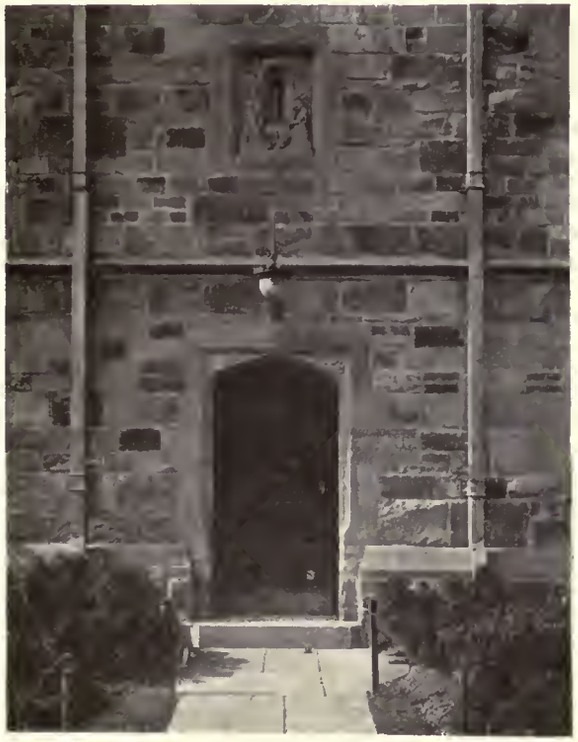
around the courts has been governed by several considerations. Generally speaking, the buildings increase in height from Library Street on the south to Elm Street on the north, which feature, as will be noted later, is intimately connected with the design of the exterior fronts on the surrounding streets. Entering from High Street through Memorial Gateway, or from York Street through Mather Gateway, one arrives in the great central square known as Branford Court, which extends 131 feet north and south, and 271 feet east and west. The buildings being lower to the south, the courts around which they are grouped may be smaller, and still abundantly lighted. Therefore we find upon the Library Street side three courts, each approximately 51 feet by 67 feet. Two have entrances from Library Street, and all are connected with Branford Court by vaulted passages, pleasingly varied in material and design, the vault construction performing the real function of carrying the buildings above. On the Elm Street side are two larger courts, approximately 90 feet by 116 feet. One is entered from Branford Court through the vaulted portals and cloistered passage of a diminutive close, forming the forecourt of Wrexham Tower, the other through a vaulted passage near the

(*Continued on page 296.*)

WHITNEY.

COOPER.

STILES.



EVARTS.

WHITE.

TILDEN.

James Gamble Rogers, Architect.

ENTRIES, HARKNESS QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

"Lexington Minute-Man," Revolutionary War. World War. War of 1812.

SCULPTURE ON THE HARKNESS MEMORIAL TOWER

(*Continued from page 294.*)

northeast angle, and both are accessible from Elm Street through gateways taking the form of English "porches."

The buildings running east and west are relatively low, while those running north and south are high; furthermore, the buildings on the south side of each court are very low and always proportionate in height to the north and south dimension of the court. Thus in the small southern courts the southerly wall is only one story high, and in the northern courts two stories, with flat roof.

Certain departures from exact right angles in the corners of the plot have been utilized to the fullest extent, resulting in effective irregularities in alignment and grouping. None of the courts is, therefore, exactly rectangular, and increased variety of aspect has been given by playful but useful variations in the plan of entrances, stair-towers, bay windows, and the treatment of angles. Likewise the variations in levels of the surrounding street have been disposed in the courts and passages with artistic effect, and to the practical end of assisting surface drainage. The effects thus obtained have been further enhanced by the creation of terraces of greater or less height at various places, offering new points of view and different aspects.

The four corners of the great central court are appropriately emphasized by towers, varied in proportion and in detail as befits their relation to the great Memorial Tower at the southeast angle. Other towers fittingly accent the lesser masses of the composition, each a leading note in its subordinate group. The multitude of chimney-stacks, which the provision of a fireplace for each study makes necessary, is frankly welcomed, and treated with great variety of detail, suppressed or strongly developed as the profiles and groupings demand. The grouping of chimneys and gable ends terminating the high units appearing above the lower roofs is of additional interest.

The bird's-eye view of the model illustrates the system of grouping about the courts, the diversity of roof masses resulting, and the emphasis of the towers, chimneys, and gables in the composition. Many refinements were introduced subsequent to the time when this model was made, and this is particularly noticeable in the Harkness Tower. Excellent as are the groupings in direct elevation throughout, no one can appreciate, except by many visits to the Quadrangle, the great beauty and picturesque qualities of the perspective groupings which present themselves at every turn as progress is made around the buildings and through the courts.

Those familiar with Yale know that its grounds and buildings are an integral part of a busy city. To harmonize the Quadrangle with such surroundings, to maintain a scholastic and residential character with seEXTERIOR clusion from the busier streets, and at the same time to unite it intimately with the university, where it closely approaches the old campus across High Street, were elements to be reconciled in the design.

The plot is approximately 354 feet from east to west, and 415 feet from north to south. The "entry system" having been adopted, access to the entries only from inner courts was decided upon. To secure adequate space in the inner courts and to keep all living-rooms within the desired limit of five stories, it was necessary that the outer walls should be placed relatively close to the street lines. Isolation, both apparent and real, is at once obtained by surrounding the buildings with an adaptation of the ancient moat, supposing it to be of that period when it was no longer required to be filled with water. Access to the inner courts is provided by bridges over the moat, pleasing features in themselves, and through tower gateways and English porches. In the moat opportunity is secured for an attractive screen planting of trees and shrubs, well protected from street traffic, and further enhancing the desired seclusion.

Allusion has been made to the different character of the streets surrounding the Quad. Let us note with what subtlety the street fronts have been adapted to their en-

(*Continued on page 299.*)

Editorial and Other Comment

The Harkness Memorial Quadrangle and Memorial Tower, Yale University

WE have in the buildings of a number of our American universities dignified and inspiring examples of what has been designated as Collegiate Gothic. The style seems especially appropriate and harmoniously in keeping with the purposes of a great university and with those reminiscences of the Old World schools of England that had their inception in the early days of the revival of classical learning.

There are those, however, who go so far as to decry any use of Gothic in these days when we have apparently travelled so far from Gothic traditions. Why Gothic? Why not something distinctively modern and American? But these seem futile questions to us in the face of such a noble achievement in Gothic as the Harkness Memorial Quadrangle, to overlook entirely certain questions of fitness, and to deny us the privilege of using the very things that have most signified in the past the spiritual and intellectual aspirations of the world.

No one who has looked upon the venerable buildings of Oxford and Cambridge ever forgets the impression made upon him. He carries away, if he has a receptive and properly sensitized mind, pictures and thoughts of the beautiful quadrangles, places shut apart from the world without, in which an atmosphere of studious seclusion exists, where the surrounding architecture seems to be the silent and fitting expression of the scholarly environment.

In the Harkness Quadrangle at Yale University the architect, Mr. James Gamble Rogers, has created, in keeping with the express wishes of the university authorities, a group of Gothic buildings that we believe will bear comparison with any in the world. Based primarily upon Tudor Gothic, they yet embody many varieties of the style and include, as a matter of fact, elements that the curious student will find tell practically the whole story of Gothic development. In many ways, notably in their details and picturesqueness, they are the most distinctive collegiate buildings in existence. There is a remarkable and enticing variety of design shown in their construction and the most surprising play of fancy. The two great towers, the Harkness Memorial Tower and the Wrexham Tower, will be admired and studied in detail by thousands of pilgrims to New Haven, and they have already excited the admiration of many architects from all parts of the country.

Mr. Rogers had the problem of placing his group in a residential and business section of the city, and he has done it in such a way as to harmonize it with its surroundings, and yet to separate the Quadrangle and give it almost the significance and distinction of a place set apart for his particular buildings.

Few will visit the Harkness Quadrangle without at once thinking of the notable buildings at Princeton designed by Day & Klauder that were shown in the February, 1918, number of ARCHITECTURE. This comment is not intended, however, in the least to suggest a comparison, for Mr. Rogers has given us something entirely distinct, and with a display of fancy and creative genius that cannot fail to excite anew the admiration and wonder of the observer. The great Harkness Tower with its delicate traceries and its sculpture is unique in being the only tower of its kind in this country. Only the Old World traveller will find it reminiscent of the lovely things he may have recorded in his European note-book. Rising high above the infinitely varied surrounding dormitory buildings, it has a delicacy and beauty in form and color that will excite the enthusiasm and admiration of every one who has the privilege of seeing it.

The color of the tower will excite instant attention. The way the stone is varied in color from the heavy base upward to the sky-aspiring top gives the impression that the architect had in mind from the very beginning a composed color scheme that should express and carry out the idea of the tower itself. From the heavier tones below, the stone gradually gives place to lighter colors until the lantern and crown are entirely in the lovely soft cream tones so expressive of the sculpture and delicacy of the carvings and other ornament placed there.

One thought that will occur to many visitors will be that Mr. Rogers has embodied in his architecture as much variety, as much difference in the character of its details, as will be manifested in the characters of the fortunate young men who will have the delectable privilege of spending their student years in such an environment. A study of the details will show moods of playfulness, humor, sarcasm, satire, inspiration, poetry associated with undergraduate life—the whole gamut of youthful human emotions.

A student of Gothic architecture need not be told that in the very diversity of construction are to be found some of its greatest charms. Even a brief glance at the buildings will show evidences of their wide diversity not only in the roofs and passages but in the windows and doorways, arches, gables, chimneys, dormers. Young men who dwell there, the whole student body, will have an unfailing school of Gothic architecture before their eyes, and with this the inspiration that comes from being intimately associated with a work of such remarkable beauty and distinction.

In the color of the stone, the picturesque variety of mass, line, and detail, in the cosiness and intimacy of the rooms, retirement and semiseclusion of the smaller courts, in the graceful arching of the old elms in keeping with the buildings, in the passing shadows on the lawns, there is a pervasive and eloquent charm. It is in the very absence of stiff and rigid uniformity that we are made to feel a mood of buoyancy, of cheerfulness, of youth. Invention, design, and careful thought for every detail are evident everywhere,

but as well a suggestion of spontaneity, the development manifested in the progress of the work itself that embody the very essence of the old Gothic buildings. The men on the work became imbued with this spirit, and their pride in their skilled artisanship was voiced recently by one of them who referred to the Quadrangle as "our buildings." From beginning to end this was the general attitude—a fine sense of co-operation and of personal responsibility. The ideals of the past were revived in contact with the inspiring and beautiful old forms. Yale may well take pride in her Harkness Quadrangle and the towers, and, fortunately, in her possession we can all share.

Mr. Rogers has built a monument of enduring fame to the memory of Mr. Charles W. Harkness and his family, to whose splendid generosity the university owes the gift of the Quadrangle and its lovely Memorial Tower, and written his own name large in the annals of his Alma Mater and in the history of our collegiate architecture.

Acknowledgment

IN gathering the material for the presentation of the Harkness Quadrangle in this number, we have been especially favored in having the cordial co-operation of all concerned. Without this very personal help, we should have been quite unable to have given such a comprehensive impression of its inception, progress, and completion. We wish to express our thanks to Mr. Rogers and the gentlemen of his office who have contributed to the issue, and to Mr. George Nichols, to whose courtesy and help on our visits to New Haven we are particularly indebted. We also appreciate fully the interest and aid of the builders in furnishing us with facts concerning the details of construction. Our especial thanks are due to Mr. James S. Hedden, superintendent of construction at New Haven, to Mr. F. S. Sutton and others of Mr. Hedden's office in charge of particular work.

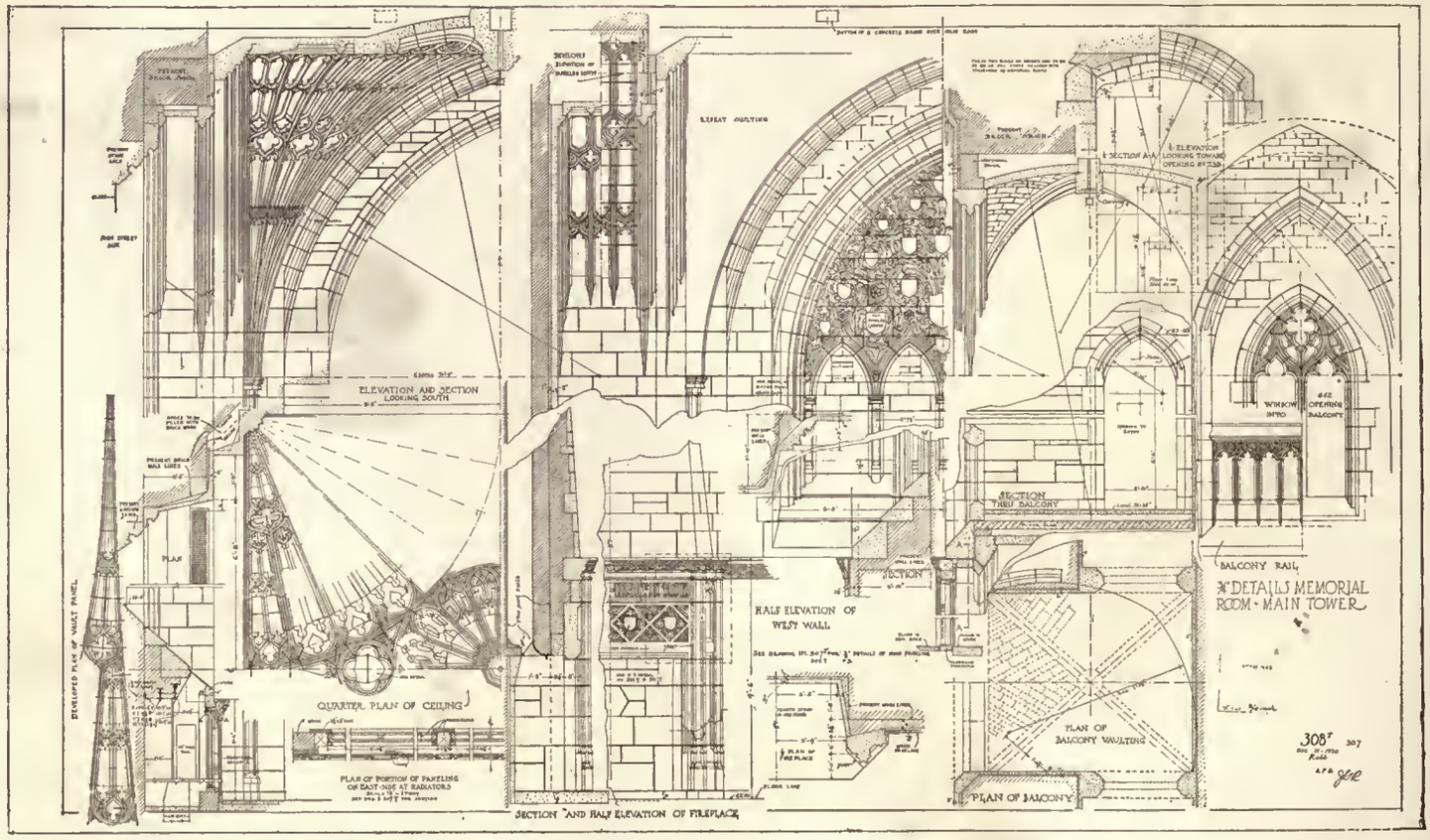
We ourselves brought from the contact with these men and the place a new sense of the inspiring value of being associated with such a really great building enterprise. The carrying out of the architect's ideas, meeting and overcoming the exceptional and difficult problems of construction involved, the distinction of the sculpture, the delicate, intricate stone-cutting—everything that expresses the beauty, power, and artistry of the buildings would not have been possible without the submergence of much of the merely business aspects of the performance into something higher. Architect and builders alike pay tribute to the splendid pride and spirit dominating the workmen of every grade. The men were "on the job" not only for wages received, but found the additional satisfaction of feeling that their own work contributed essential elements to the artistic success of the whole development.

In Early Numbers

THE editor wishes to announce the early resumption of the valuable series of articles by Mr. Pond and Mr. Walsh and the beginning of an interesting series of articles on some of the great French decorators.

In keeping with our policy we shall continue to devote considerable space to small houses and housing developments in general. We believe that every one of our readers will value this special October number, and there has already been such an unprecedented demand that we have been compelled to print an extra large edition.

In spite of a constant increase in our printings of late we regret that we have been unable to fill all requests for recent issues.

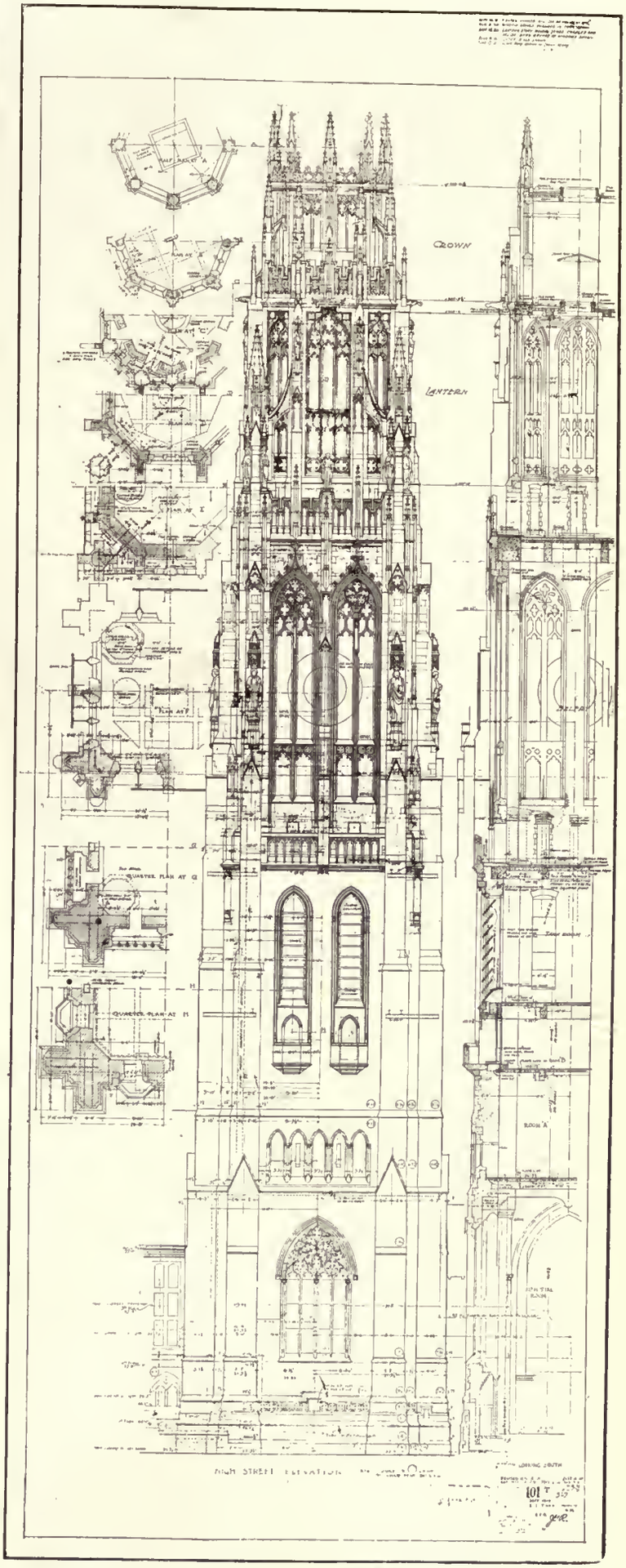

ELEVATION AND SECTION LOOKING SOUTH
HALF ELEVATION OF WEST WALL
SECTION THRU BALCONY
DETAILS MEMORIAL ROOM - MAIN TOWER
QUARTER PLAN OF CEILING
PLAN OF BALCONY VAULTING
PLAN OF BALCONY
SECTION AND HALF ELEVATION OF FIREPLACE

Details of Memorial Room in Harkness Memorial Tower.

BRANFORD COURT AND HARKNESS TOWER.

James Gamble Rogers, Architect.

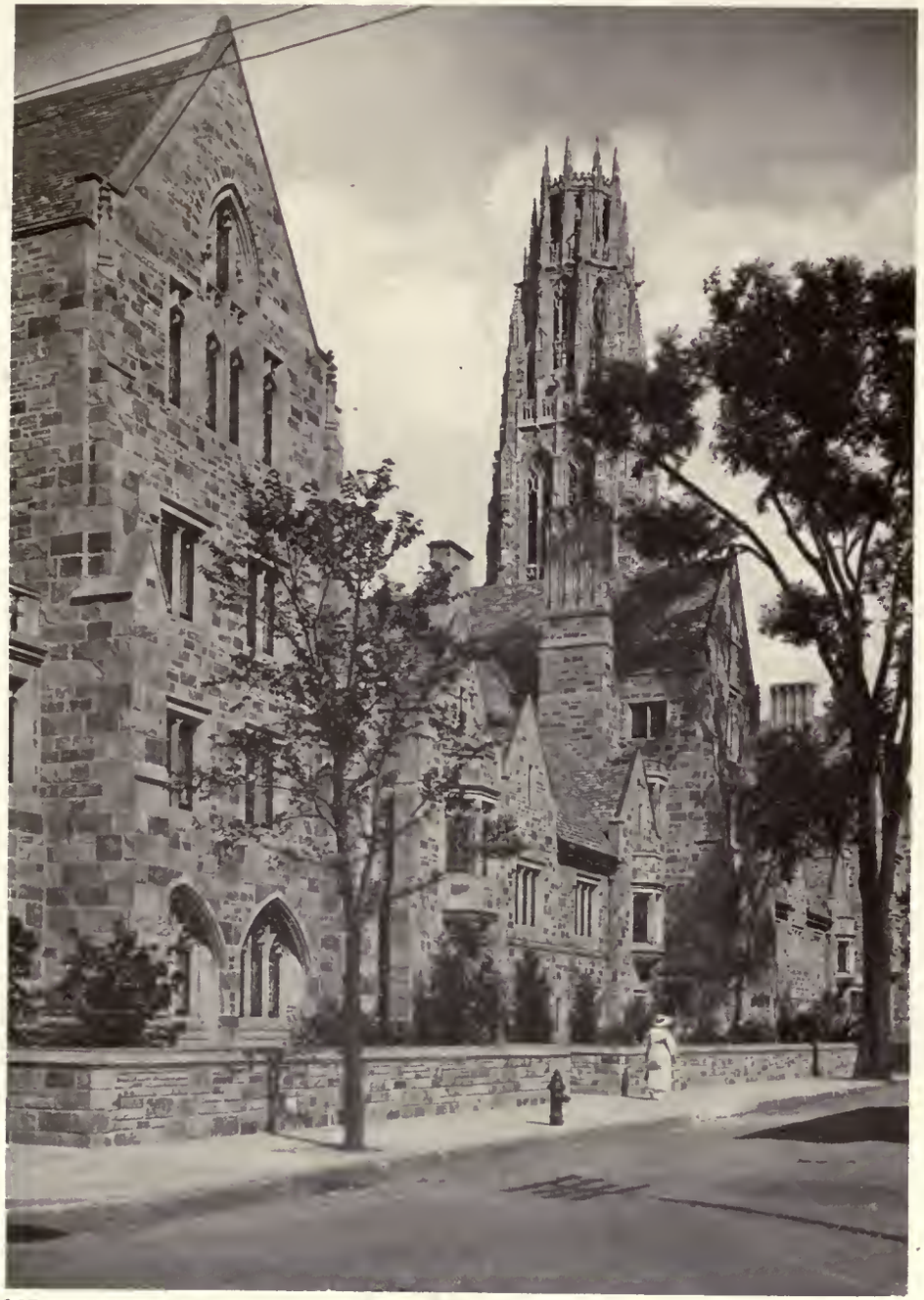
HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.



DETAIL AND ELEVATION OF HARKNESS TOWER.

James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.



LIBRARY STREET AT YORK.

KILLINGWORTH COURT. James Gamble Rogers, Architect.

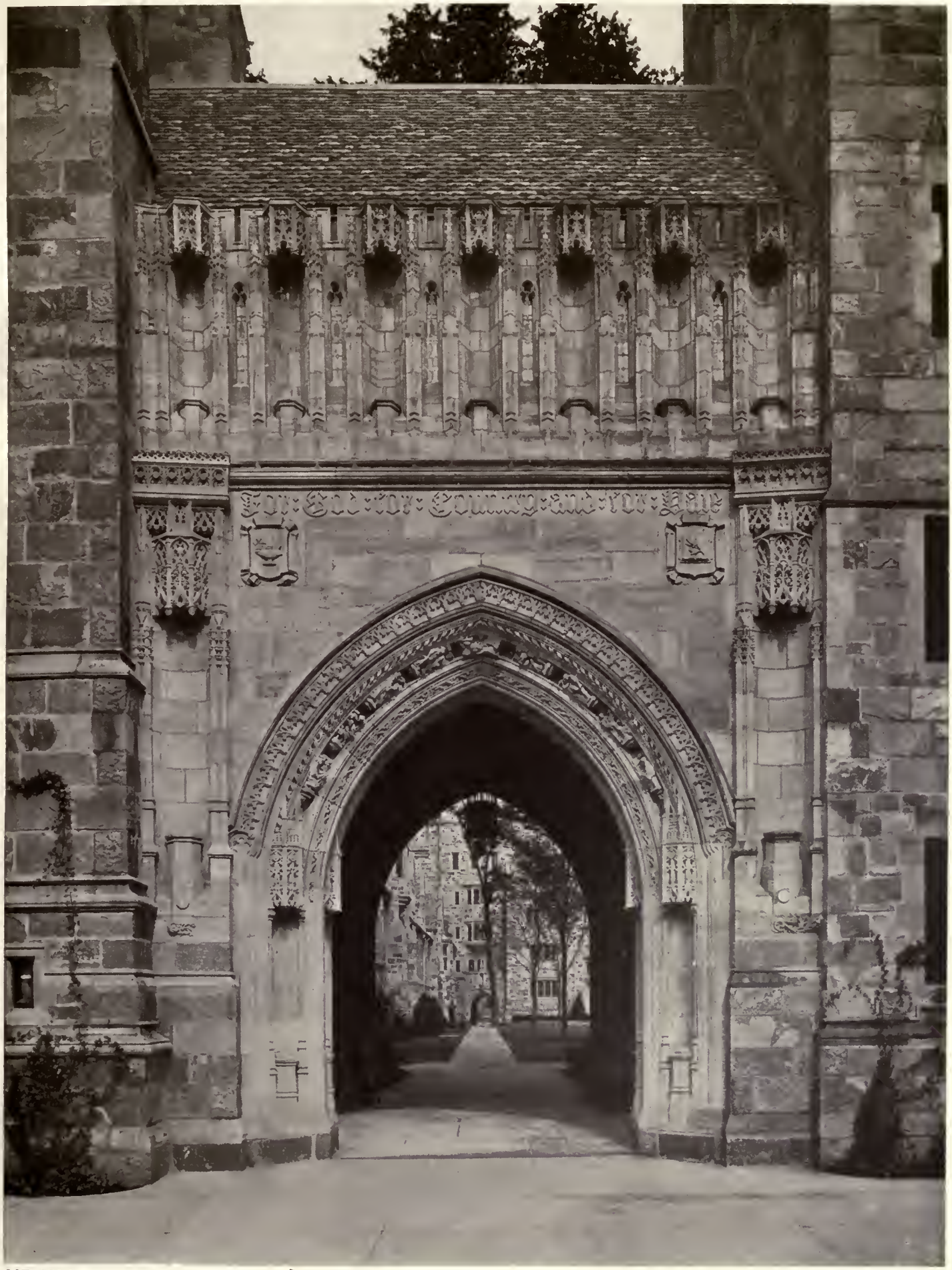
HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

WREXHAM TOWER FROM BRANFORD COURT. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

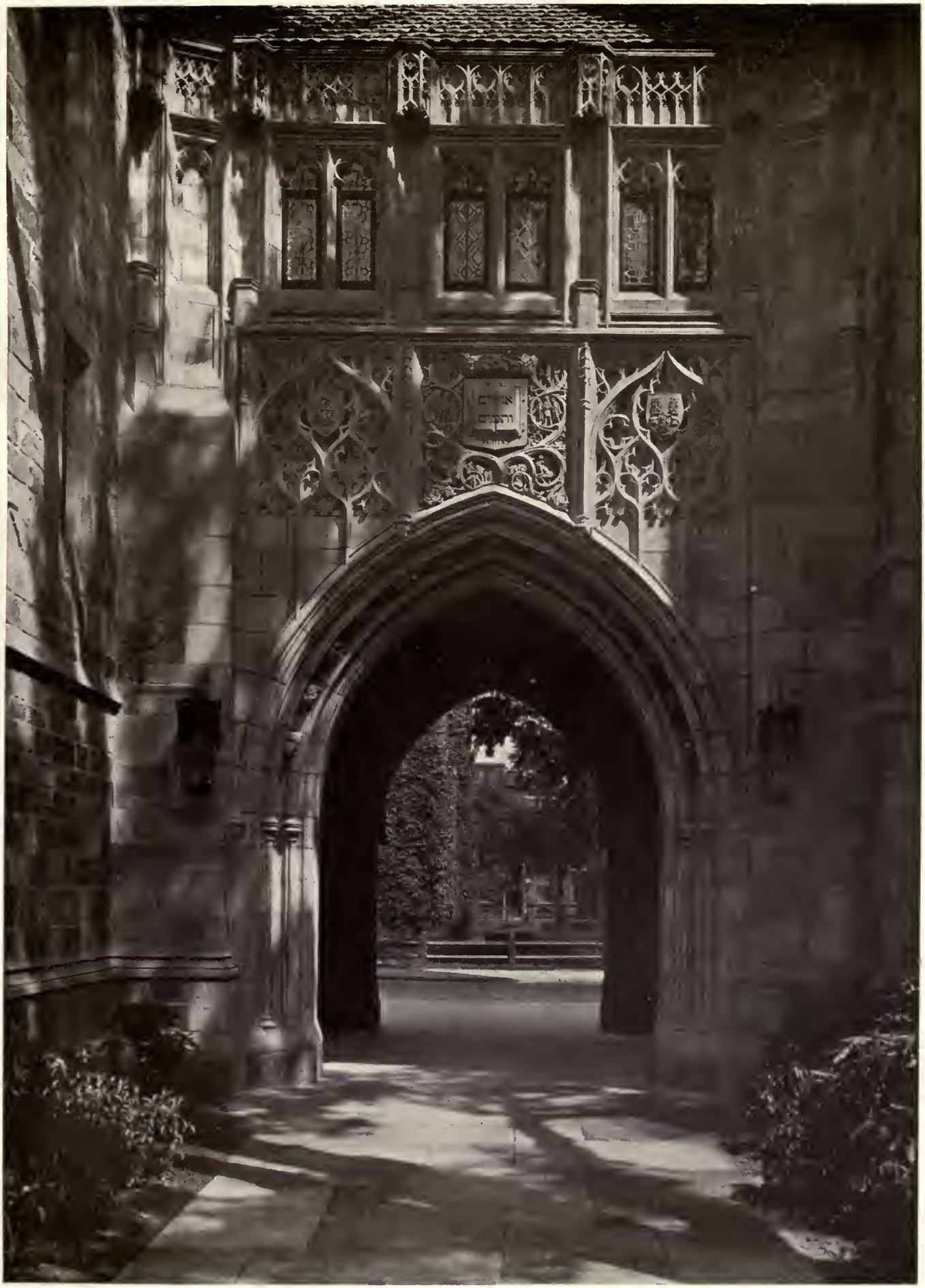
TOURELLE AT NORTHEAST ANGLE OF BRANFORD COURT. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.



MEMORIAL GATEWAY. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.



MEMORIAL GATEWAY FROM BRANFORD COURT. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

MASON ENTRY—BRANFORD COURT. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

LIBRARY STREET FRONT.

HIGH STREET.

ELM STREET.

James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

BRANFORD COURT PORTALS OF PASSAGE TO CALLIOPE COURT.

BRANFORD COURT PORTAL OF FITCH GATEWAY.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

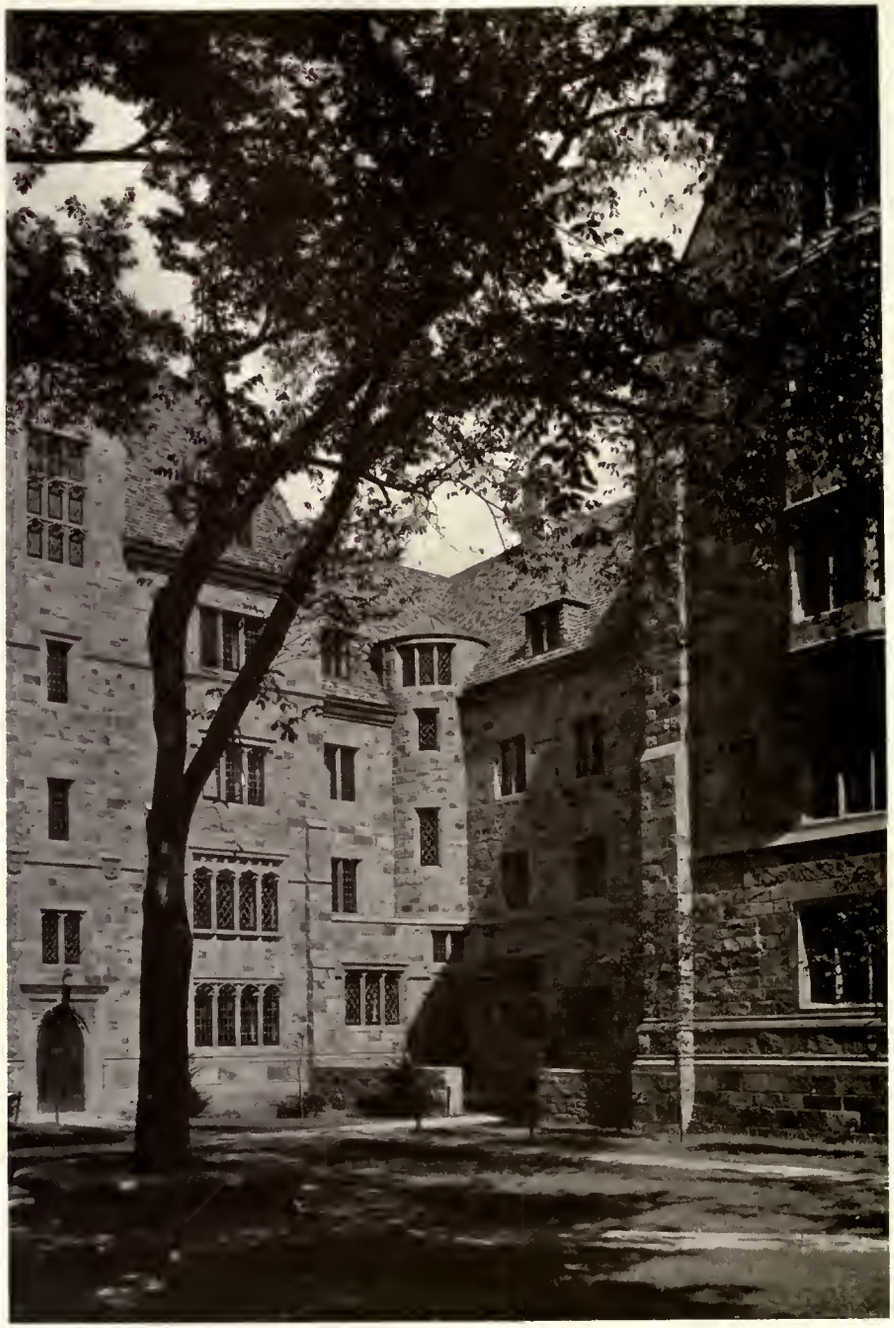
James Gamble Rogers, Architect.

SOUTHWEST ANGLE, KILLINGWORTH COURT.

NORTHWEST ANGLE, BROTHERS-IN-UNITY COURT.
Statue of Noah Webster in niche.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.
James Gamble Rogers, Architect.

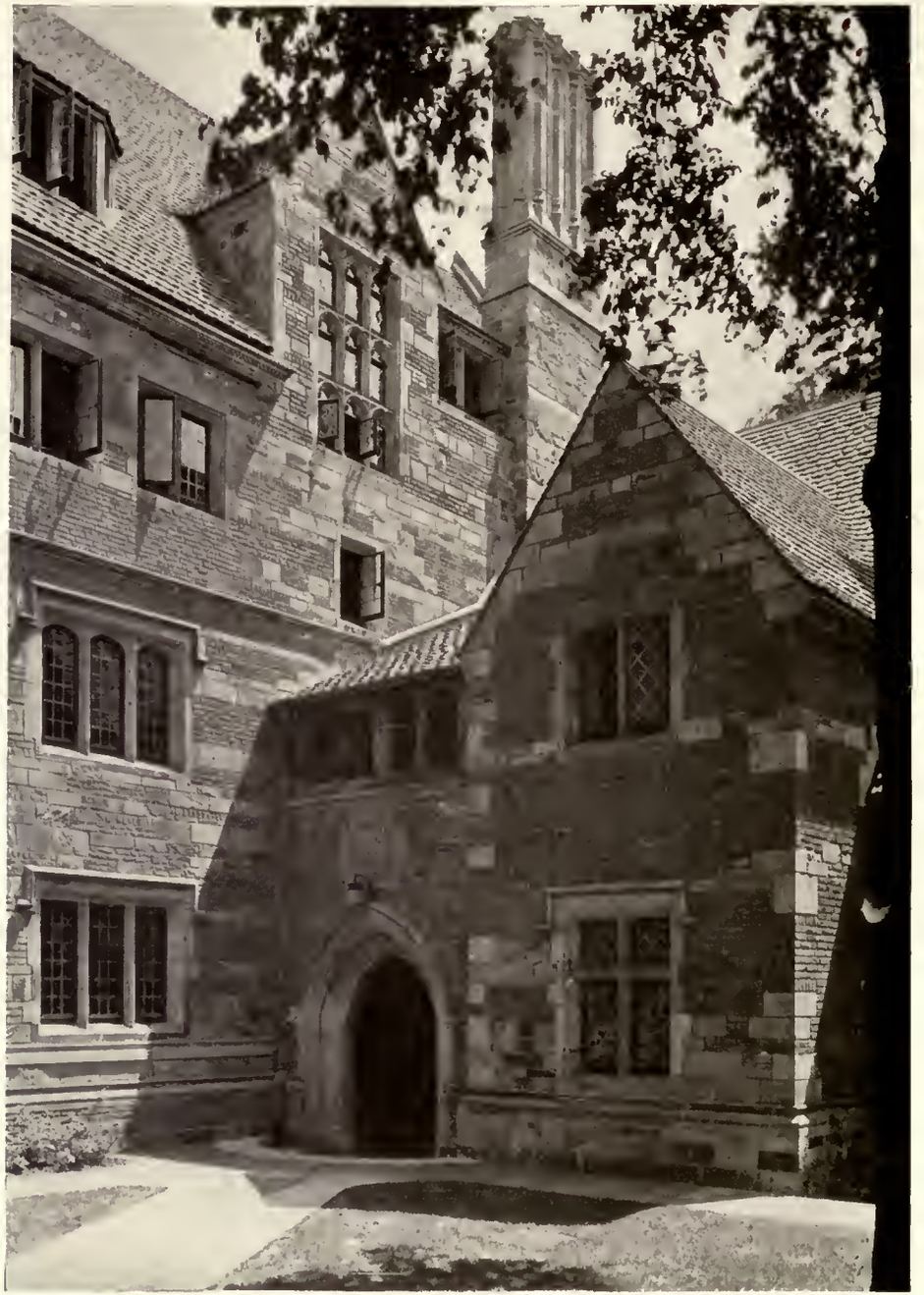
NORTHEAST ANGLE IN LINONIA COURT.



NORTHWEST ANGLE IN SAYBROOK COURT. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

SOUTHWEST ANGLE, BROTHERS-IN-UNITY COURT, DAVENPORT GATEWAY.



SOUTHEAST ANGLE, LINONIA COURT, PIERPONT GATEWAY.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

James Gamble Rogers, Architect.

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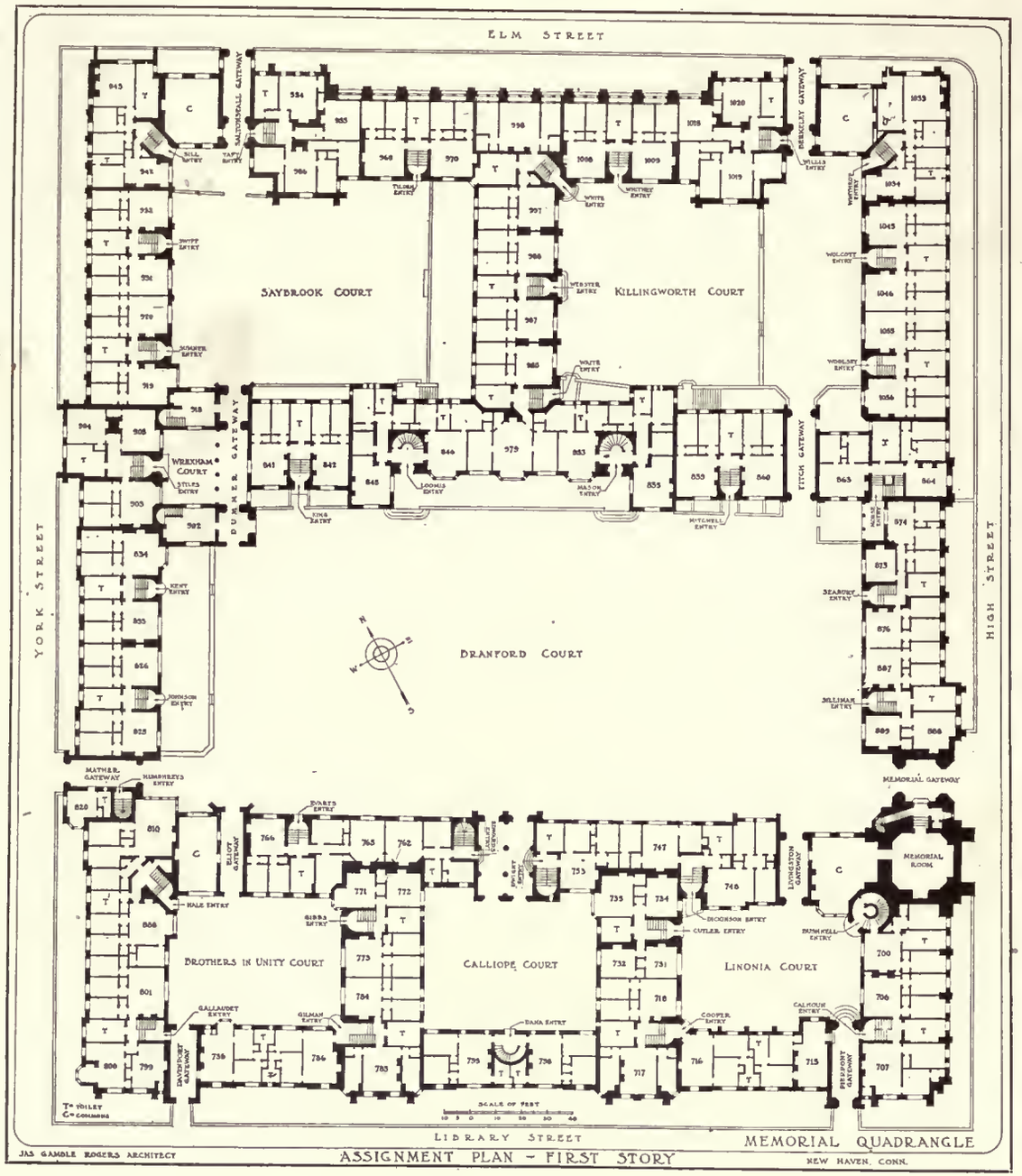

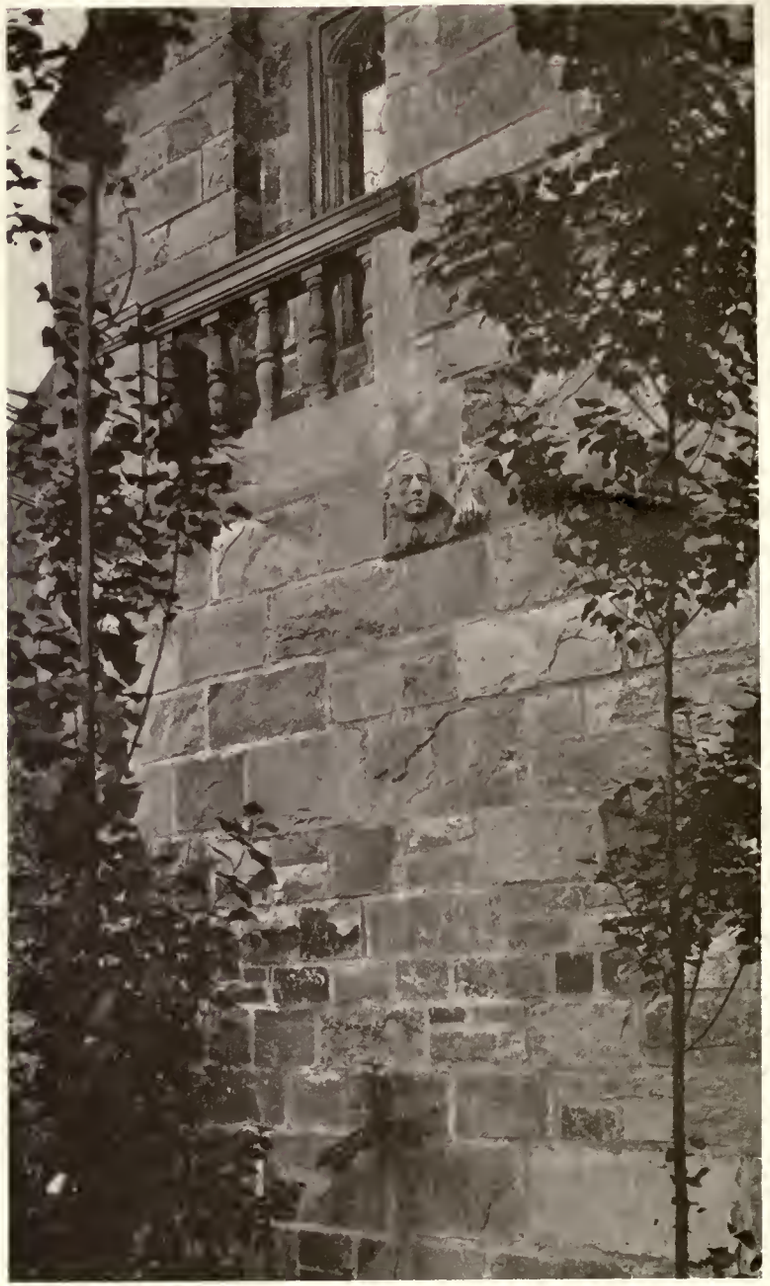

DETAIL OF STONEWORK. James Gamble Rogers, Architect.
Sculptured Portrait of E. Donald Robb, Assistant in Gothic Detail.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

PRELIMINARY STUDY FOR TRUMBULL COMMONS.

PRELIMINARY STUDY FOR TRUMBULL COMMONS. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

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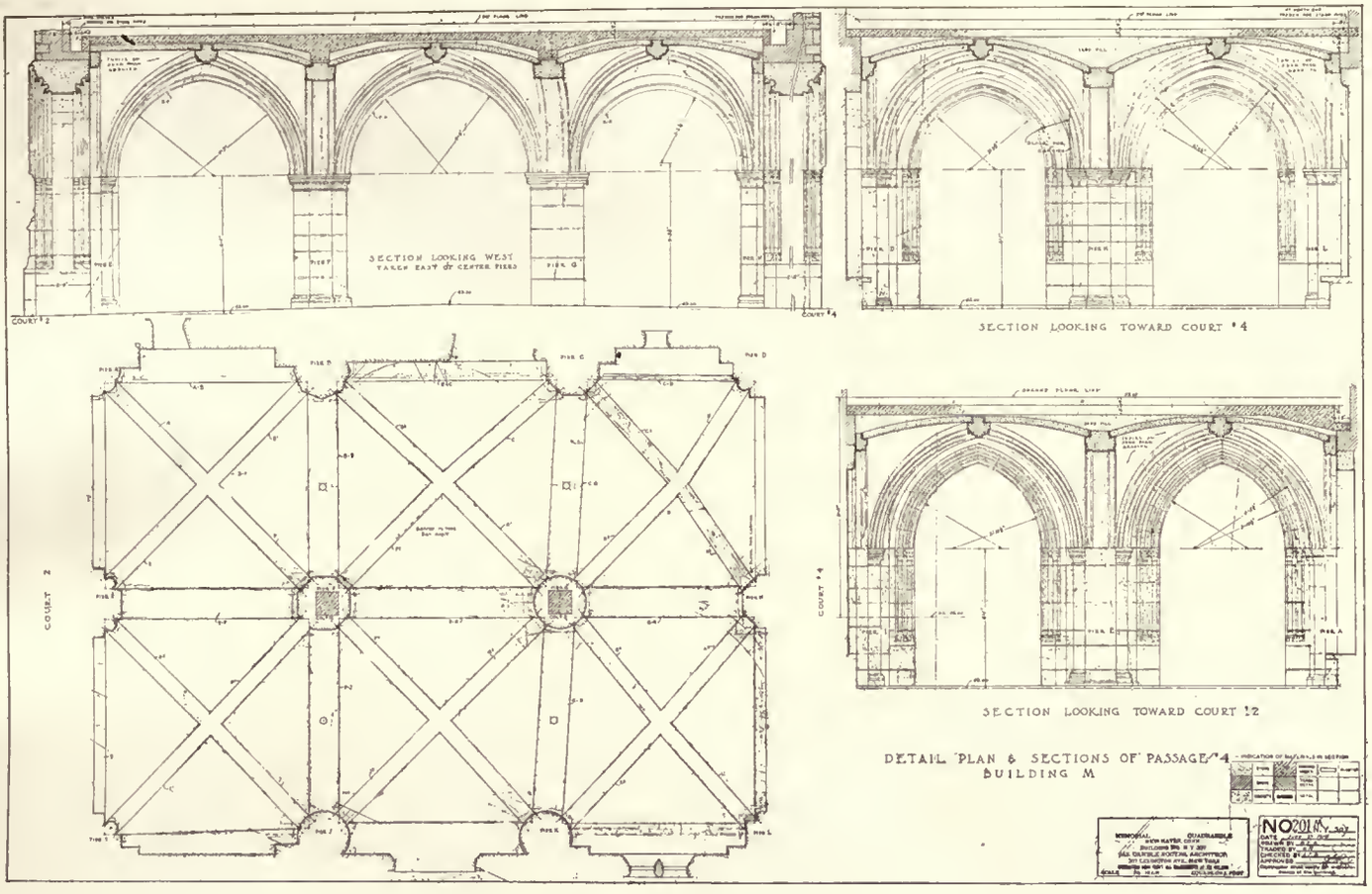

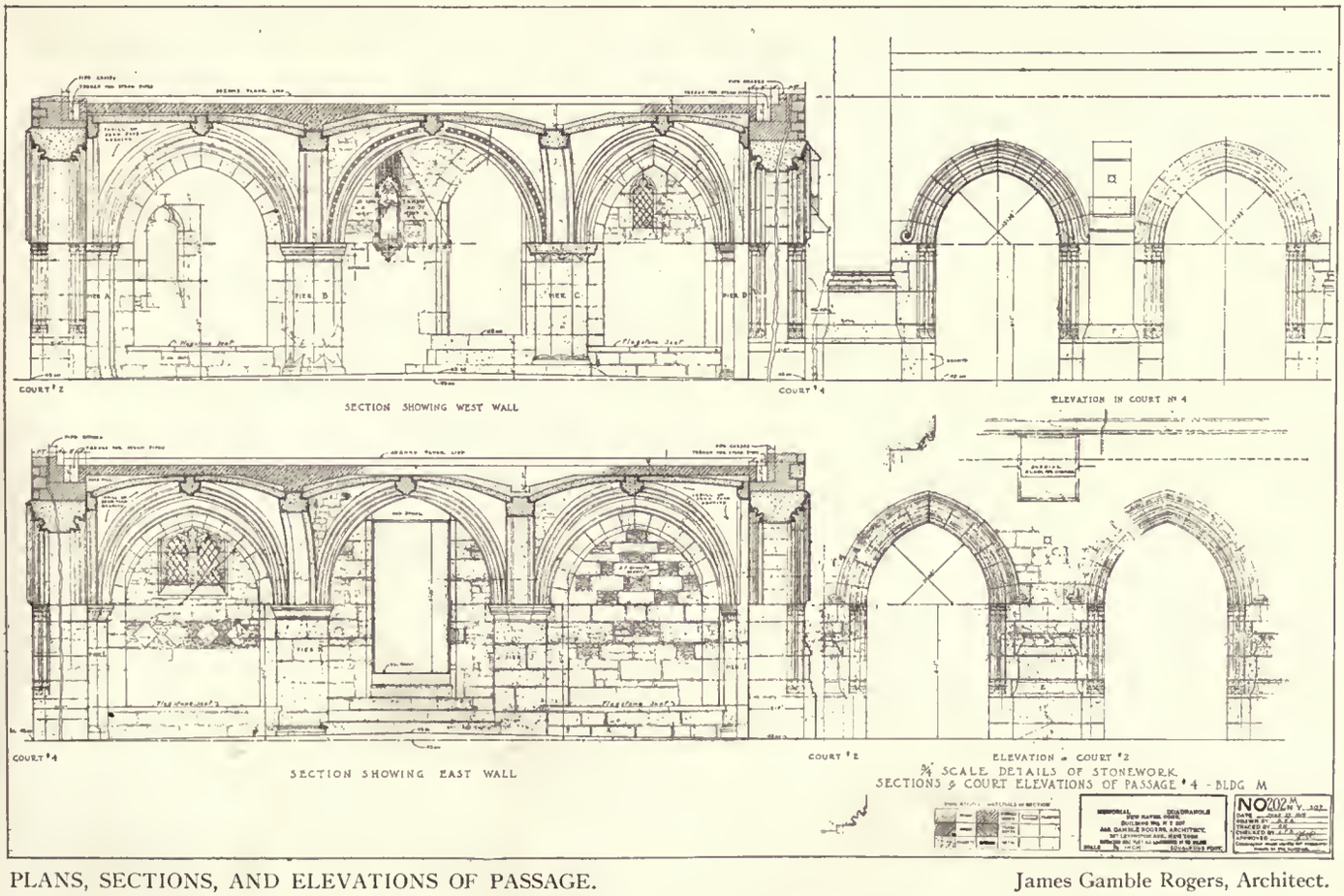
COURT 2
COURT 4
SECTION SHOWING WEST WALL
ELEVATION IN COURT No 4
SECTION SHOWING EAST WALL
ELEVATION of COURT 2
¾ SCALE DETAILS OF STONEWORK
SECTIONS & COURT ELEVATIONS OF PASSAGE 4 - BLDG M

PLANS, SECTIONS, AND ELEVATIONS OF PASSAGE. James Gamble Rogers, Architect.

HARKNESS MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

Construction of passage to Calliope Court.

(*Continued from page 296.*)

vironment. Library Street is a secluded byway, one block in length. Here the moat is deep and its enclosing parapet low. From Library Street north on York toward the busier Elm Street the moat becomes shallower, but the first-floor level rises, and with it the enclosing outer wall of the moat. The same change occurs on High Street, but the parapet is here modified by a low section opposite the opening to the old campus, serving to bring the new buildings into more intimate relation with it.

At the corners of Elm Street the parapet reaches its greatest height, accompanied by the highest elevation of the first-floor level. The central section on Elm Street, however, is very low and broad, anticipating future conditions with which this height will accord. Here the buildings are withdrawn to a greater distance from the street line as compensation for the lessened protection of the low parapet.

Observe now how the character of the architecture itself is harmonized with the character of the respective streets. In quiet Library Street the long, low, two-story buildings are broken only by the high gables of the units running north and south, which serve to accentuate rather than destroy the horizontal lines, since they stand well back from the unbroken stretch of moat wall. The detail of the buildings is delicate and simple, early in period, and intimate and rural in its feeling. On York Street there is

Vaulting of passage to Calliope Court. Sample wall and roof in background.

a gradual transition from this atmosphere. As Mather Gateway is reached a stronger note appears, which is increased by the sturdy treatment beneath Wrexham Tower. Beyond this point the highest buildings of this façade occur, and their detail is increasingly simpler and bolder as Elm Street is reached.

On Elm Street the highest and most rugged characteristics obtain. Later Gothic details and early Renaissance touches are interwoven. The gables are advanced to the street line, and the strong vertical lines of their buttresses are made visible from bottom to top. This front is a symmetrical composition, its terminations strongly defined by the towering gables and buttresses and the projecting porches of Saltonstall and Berkeley Gateways. The lowest story of the central portion is made up of a series of eleven great traceried openings, massive in scale and topped by a strongly marked string-course striking a sharp horizontal note in contrast to the vertical masses of the terminating gables. This repeating arcade, behind which the first-story wall is recessed, as if for an ambulatory, in all but three openings, serves the practical purpose of concealing the irregular fenestration of the numerous small rooms behind

Passage to Calliope Court.

its recessed wall, and at the same time creates a large-scale horizontal motive in keeping with the character of the street.

City conditions in High Street are happily less in evidence than on Elm or York. There is much less traffic, and no cars. It is occupied for several blocks by university buildings, and the west side of the campus opens invitingly. The dominating feature of the Quadrangle, the Harkness Memorial Tower, has been located opposite this opening. To the south of the opening stands the old library, in itself a venerable and interesting example of early American Gothic architecture. It is intended that the opening to the campus shall be enlarged by the removal of Dwight Hall. This will leave the north side of the opening flanked by Wright Hall, a modern Gothic building not inharmonious with the Quadrangle. Thus the Harkness Tower is now in full view from the campus, and will later be seen between two buildings similar to it in fundamental character. Approaching across the campus the mighty uprush of its splendid shaft is in view from the first spring of its great buttresses to the graceful pinnacles of its lace-like crown. So the tower dominates both the old college and the new Quad, and links them inseparably.

Against the north side of Harkness Tower stands the Memorial Gateway, a feature subordinate in size to the other elements of the High Street front, but withal a mighty arch, emblazoned and decorated with an intricate display of Gothic ornament. Thus asserting its importance as the principal gateway, it invites approach from the old campus and entrance into "the intimate retreat of its inner courts."

It is interesting to observe the devices by which the buildings adjacent to Harkness Tower have been brought into harmony and scale with its massive lower stories. To the south is a building which might have been an old church or lofty hall. Between its heavy buttresses appears the side-aisle of its nave, while above are large mullioned windows, the middle section of which the designer has happily been able to fill with a rough walling so that the floor of his third story of dormitories might be carried through. The sexton's stair turret appears near the corner, terminating the hall with vertical emphasis, and rising into a pinnacle which echoes to the best of its ability the rising lines of the tower. A large-scale unit in the design has been achieved, which nestles against the tower without loss of dignity. To the north of the tower we shall see the same device of filling the central openings of the large window groups of a great hall. Separating this unit from the next is the tower-like seven-story building which marks the northeast angle of Branford Court within the Quad. By clever devices our eye is led upward along its sturdy walls, still upward to its towering chimneys, and finally to the "jewel tower" above it all; a fair reward indeed for the aspiring sight, and a lovely echo of the more majestic beauty of its master neighbor. A lessened vertical emphasis appears in the two-story bays of the succeeding four-and-a-half-story building, whose northern gable supports a chimney of emphatic height and interest. Beyond a lower building is carried to the Elm Street corner, stepping down nicely to the high parapet wall, with an amusing corner balcony beside the tall shaft of the final chimney.

And if from Elm Street this front is viewed in sharp perspective, or if a similar view-point from beyond its southerly end at Library Street is taken, one of the most effective artifices of its design becomes apparent. At each side of the Memorial Tower all horizontal lines have disappeared, hidden between the projections, and the mighty buttresses of the tower rise amid a multitude of echoing vertical lines, to which the pinnacles and chimneys add their spirited accents against the sky.

The great pointed arch of the Memorial Gateway stands slightly recessed between the rugged buttresses of Harkness Tower and the rough walls of the adjacent dormitory unit. It is entirely of Briar Hill stone.

MEMORIAL GATEWAY

The transition from granite walls to the portal is accomplished by a surrounding frame of flanking niches, their traceried canopies and crowns coupled by a strongly moulded string-course and surmounted by a decorative attic; a striking composition of vertical accents in light and shade. The archway itself is defined by numerous ornamented mouldings, the chief of which is embellished with miniature sculptured groups, typifying the various schools of the university, the figure of Alma Mater occupying the centre. Above is inscribed "For God, for Country, and for Yale," the concluding line of "Bright College Years," the song dear to all sons of Eli. Another Yale song is recalled by the entwined thistle, rose, shamrock, and elm carved on the central boss of the vaulted ceiling within the portal.

In the south wall of the gateway a vestibule opens, leading to a lofty vaulted chamber within the tower, which is lighted through the great traceried window forming a feature of the High Street front. This room will be used for meetings upon special occasions, and will contain, in some practical, unostentatious form, a memorial to Charles William Harkness. Entered from the vestibule to the memorial room, a spiral stone stair within the tower buttress leads to a gallery, and thence upward to a meeting-room, which finds place above the Memorial Gateway. These rooms within the tower are the only portions of the Quad not yet completed.

The inner face of the Memorial Gateway bears a wealth of Gothic tracery above its arch. In the centre are the arms of the university, flanked by those of Connecticut and New Haven. In the central panel the twining tendrils of a conventional growing vine frame several miniature sculptured scenes which depict the planting of the class ivy in successive historic periods. The band of Indian scouts peering through the Gothic foliage at the ceremonies of 1703 is but one of many delightful whimsicalities to be found throughout the sculptured ornament. Within the arch-mouldings the seven leading athletic sports are portrayed by the hand or foot, alternating with clusters of ivy, oak, laurel, and other symbolic foliations.

Beautiful as are the street fronts, and engaging as is the welcome of the Memorial Gateway, the visitor emerging into Branford Court, the great central square of the Quad, will view with delight and astonishment the scene which presents itself. "There is something like a spiritual revelation to have such loveliness in the midst of a town—to step from a twentieth-century street into the thirteenth century, to exchange the busy ways of commerce for the seclusion of academic shades. . . ." Surrounding us are walls of that colorful seam-faced granite which has been spoken of. In the street fronts its rugged strength has been emphasized by suitable form and scale; here we see it adapting itself with increased beauty to the environment of spacious lawns and the caress of clinging shrubbery. This wall sparkles in full sun, that glows with color veiled in shade, while upon others the shadows of the elms cast their bewitching tracery.

INNER COURTS

Following the quaintly flagged paths about the court it becomes apparent that to carefully considered grouping has been added the charm of a skilful contrast in the profile and detail of each main and subordinate group. The increase in height of the buildings from south to north, which produced three courts on the south and two on the other side, permits the two sides of the central court to be contrasted interestingly in plan. In the centre of the south side is the double portal of Calliope Court, forming the first story of a battlemented square tower, which is brought forward and forms the central feature of long two-and-a-half-story buildings, at either end of which are the gateways to Linonia and Brothers-in-Unity Courts. The opposite mass on the north side is without a central opening, and is recessed, enclosing between its terminating wings a raised terrace, which may be used for outdoor plays and as a rostrum for meetings. The effect of an amphitheatre has been simulated by the disposition of the flagged paths, which curve in toward the central terrace at each side. In this central building will be observed a mingling of early renaissance forms with the late Gothic, further touches of which occur more frequently in the northern courts. Here again the expedient of gaining increased and dominant scale by fenestration simulating the presence of a lofty hall is carried out in a succession of beautiful mullioned and traceried bays.

The westerly buildings in Branford Court, and the

easterly as well, are quiet compositions as befits their shorter length and their closer connection with the great and lesser towers. The means by which these connections are established are varied. In one angle an arcaded screen is introduced, in another it is accomplished by the low units advanced to form the forecourt of Wrexham Tower, and elsewhere by other devices of plan.

All about us are the doors to the so-called entries, or stair halls, giving access to the rooms. Each is inscribed with the name of a distinguished graduate, and the accompanying sculptured ornament is symbolical of his achievements. The names of the entries are alphabetically arranged, the series beginning at the base of the Harkness Tower in Linonia Court. The portals of the passages leading to the smaller courts are infinitely varied in design, and are inscribed with the names of early patrons of the college. Through them fascinating glimpses of the courts beyond may be had.

The variety and appropriate form and character given to the fenestration, to each bay and gable, and the effective accentuation of sculpture and carving are worthy of remark. In the leaded windows the diamond panes add brilliance at the more important points; elsewhere the quieter square panes are relieved by eccentric departures from precise regularity. Here and there the flash of a Norman slab is seen, and the broken lines of supposititious repairs add the charm of age.

With the exception of the Wrexham Tower, which is modelled after the tower of St. Giles at Wrexham, Wales, the burial church of Elihu Yale, there is no single feature or group which is a conscious replica of any existing building. And still the charm of the Old English Colleges has been caught and fixed. The spirit of the chosen style has been so absorbed, and the manipulation of its characteristic features so perfected, that the requirements of modern construction, equipment, and plan have been clothed in the veritable atmosphere of ancient university buildings.

The delightful mellow effects of age have been sought and successfully reproduced. This has been done, not from the foolish but, unfortunately, very common standpoint that whatever is old is beautiful, but from a realization that age produces colors and textures of great beauty, and that the limitations of ancient handicraft contribute greatly to the undeniable charm of the antique. By analysis of these effects, by a clever choice of materials, and by the utilization of many results from modern mechanical tools and processes which are often overlooked and discarded, this charm has been reproduced with astonishing fidelity.

Thus it will be noted that the stones do not fit with obtrusive precision, their edges are not perfect, and their surfaces exhibit the marks of whatever tool would cut best that particular piece. Old bricks have been used, chosen for their size and color, and since old bricks must be cleaned, the sand-blast has been used, softening their surfaces and rounding their outlines. The violent colors of new pressed bricks have been reduced to mellow harmony by the same process, and in laying the bricks marked departures from the monotonous precision of so-called skilful bricklaying have purposely been made. A special roof tiling has been developed, the surface being combed or roughened in the moulds, to promote the retention of dust and the growth of moss, the edges chipped to irregular outlines, and the tiles finally glazed with various colors to harmonize with the walls, all with the intent to secure a certain effect unobtainable in natural slate or stone. It may be said that the roofs are expected to become appreciably softer and more uniform in color as time goes on, and that the selection of glazing colors has been made with this end in view. The roof tiles are thickest at the eaves, and become gradually thinner toward the ridges, and the exposure likewise diminishes in the same direction. The courses are continued through the valleys in gentle curves, and at the junctions of the roofs with gable copings the right angle has been softened by an upward curve of the roof. This device takes up the gradual falling away of the tiled surface from a line parallel to the coping, due to reduction in thickness, and results in the easement curves with which the ridges join the coping peaks. The metal work of the roofs, including gutters and leaders, is of copper, lead coated to secure harmony of color, and the leader heads are of different antique patterns.

At the centre of Branford Court the imposing outlines of Wrexham Tower, which have been glimpsed through the elms, are fully revealed. Upon nearer approach it will be seen that its base has been surrounded by a group of low buildings, so that its apparent distance from Branford Court is increased, and it asserts itself only as a crowning feature. Turn now and behold the majestic Harkness Tower in its best setting. Its nearer corner stands well within the court, permitting full realization of the strength of its lower shaft, whence it rises, ever lighter in form and color, more exuberant in line and ornament, until it terminates in a bewildering richness of tracery and pinnacles 216 feet above the ground. As it lifts itself above the roofs, note the restraint with which the solid wall is pierced by louvers, their tiled surfaces carrying the roof color up into the tower. See also the vigor with which the solid balconies below the louvers terminate the series of vertical openings above. The gallery of the belfry marks a binding horizontal line as the wall recedes and multiplication of vertical elements begins, accompanied by the first touches of ornament. Then the bel fry rises, still four-square, with great traceried lancet open ings, through which, at morning and noon, sunset and cur few, will soon come the mellow tones of chimes. Half-way up the belfry, upon the eight corner buttresses, are cano pied niches occupied by heroic effigies of Elihu Yale and the university's most eminent sons. They are, beginning at the southeast corner, facing High Street: Elihu Yale, Jonathan Edwards, Nathan Hale, Noah Webster, Fenimore Cooper, John C. Calhoun, Samuel F. B. Morse, and Eli Whitney. At about the same level there will later appear clock-dials in bronze tracery, applied over the architectural features. Higher up, on the mullions of the belfry openings, are smaller figures of Phidias, Homer, Aristotle, and Euclid, typifying the arts and sciences. Upon the finials of the tapering crocketed labels of the belfry openings the Yale bulldogs appear, sheltered below the cornice which marks the beginning of the lantern, and carries the traceried parapet of the lantern gallery.

HARKNESS TOWER

The ease with which the vertical members of the square belfry terminate and merge into the octagonal lantern is worthy of attention. The central buttresses bear free standing figures emblematic of Business, Law, Medicine, and Ministry, silhouetted against the lantern opening of each side. The corner buttresses diminish by successive gablets and weatherings, merge into the main corners of the tower, which are carried up from the base with certain diminishing transitions, and terminate in pinnacles forming the counterforts of flying buttresses leading gracefully upward to the crown. Engaged in the angles of the corner piers at the level of the lantern gallery are twelve figures, uniform in size with the four just mentioned, and representing Life, Progress, War, Death, Peace, Prosperity, Effort,

Order, Justice, Truth, Freedom, and Courage. On the eight intermediate buttresses which form the corners of the lantern, and near their top, are martial figures typical of our soldiers in the country's wars, from the Revolution to the World War. Just above these figures are gargoyles in the form of students, suggestive of various undergraduate activities, scholastic, literary, social, and athletic. Central between the gargoyles are masks of the classic poets, Virgil, Homer, Dante, Shakespeare. Above the lantern is the terminal stage, the crown, also octagonal, but presenting its angles in the centres of the eight sides below. By this adjustment there is secured a double crown of pinnacles of mysterious intricacy, the lower tier melting into the traceried parapet which unites the pinnacles of the upper crown.

Glancing again at the base of the tower, note the careful rendering in color, which, though common in pictorial architecture, has been accomplished here, perhaps for the first time, in stone. The largest, darkest, and roughest granite has been built into the base of the tower, and as the tower rises the colors become lighter and the texture smoother. Bits of the sandstone trimming stone begin to appear, and as still greater height is gained, the granite becomes less in area and still lighter in color until it vanishes altogether in the lantern, and the tower is completed entirely in the lightest golden sandstone. Note, also, the increasing tide of ornament and sculpture as the tower rises, every line of the bottom growing, budding, and blossoming as it ascends.

COLOR

Having traced this effective gradation of color and ornament in the tower, note the contrast in the color of adjacent buildings, and in the towers forming counterbalancing elements in the general group. In Wrexham Tower the colors of the granite have been restricted to grays of various tints, and the trimming stone is gray Indiana limestone. The same color has been used in the tower at the northeast angle of Branford Court. Whatever the weather conditions, Harkness Tower glows with warmth; the other towers remain subordinate in the color scheme.

Similar color contrasts may be noted in the northerly buildings of Branford Court, those units adjacent to the above-mentioned towers being limited to gray and the central building to half-gray. In the other sides of the court the full range of granite color is used, with Briar Hill sandstone trimmings, but the darkest obtainable granite is reserved for the base of Harkness Tower.

To this lightening in weight, color, and line, as the tower ascends may, perhaps, be attributed the impression which it creates of "leaping into the air," of having no ponderable weight upon the ground. Borrowing many of the features of its Gothic prototypes, it is unaffectedly modern in its sculpture and feeling, and forms a fitting and triumphant climax to the general composition.

The considerations which resulted in the location of the great Harkness Memorial Tower at the southeast angle are discussed elsewhere. Satisfactory balance of the group demanded the echoing of this dominant element with another tower of considerable size at the diagonally opposite angle, and such a tower found a place in the preliminary study. To Mr. Anson Phelps Stokes, then secretary of the university, who followed the inception and development of the design with the keenest interest and appreciation, is due the happy suggestion that there should be incorporated in the group a replica of the tower of St. Giles at Wrexham, Wales, within the shadow of which stands the tomb of Elihu Yale. The tower which early sketches of the Quadrangle show at the northwest angle of Branford Court was thereupon transformed into a replica of the Wrexham Tower. Over its doorway has been set a stone from the older Wrexham, presented by the vestry of St. Giles's Church to the university, thus visibly linking the old world with the new.

WREXHAM TOWER

Mr. J. Layng Mills, Yale '01, writes of this tower as follows: "Considered as architecture, the Wrexham Tower on the York Street side of the Memorial Quadrangle is an achievement in itself. Designed to give a strong accent to this façade and at the same time to give balance to the more lofty Harkness Tower in the general composition of the group, it accomplishes both of these purposes admirably —the more so because in opposing two vigorous silhouettes, one dominant and one subordinate, the continuity of the design of the entire group, the balance between the two sides of the square, and the scale of the whole has been preserved to a remarkable degree. . . . It is an essential part of the group to which it belongs, and this was not a task easy of accomplishment. Mr. Rogers has told me that he purposely avoided having any measured drawings made of St. Giles, or even any photographs in his office of size enough for the details to be distinguishable, while the designs of his tower were being made. This required real courage, and yet I cannot imagine any other way in which continuity of design and scale with his larger group could have been preserved."

The smaller courts toward Library Street have each a distinct individual character, due principally to differences in the materials and colors of their walls. They are named for the famous literary and debating societies which flourished at Yale in the early nineteenth century. In each court the south wall is only one story high, and the nearness of the long, sloping roofs to the eye brings the beauty of the tiles strongly into the picture. In Linonia Court, the one nearest to Harkness Tower, the walls are of mingled antique red brick and seam-faced granite. The bricks have been softened in texture and outline, and are laid with considerable irregularity. This court is entered directly from Library Street through Pierpont Gateway, whose ceiling vaults are also of antique red brick but of greater age, smaller in size, and more striking in color. These bricks were probably first used in the "Old Brick Row" which stood along College Street, facing the green. The present "Connecticut Hall," now surrounded by the modern buildings of the campus, is the only survivor of these early college buildings.

SMALLER COURTS

The central one of the southern courts, Calliope, is to be reached only from Branford Court through a double passage, vaulted with seam-faced granite, showing the full range of color afforded by this material. The bonding of the vault stones is extremely irregular. They are arranged primarily for color effect, shaded from dark tones at the spring to light tones in the crown. The plan of the passage is "warped" in true mediæval style, to accommodate the unbalanced relation of the two opposite entries. With equal freedom each of the central columns and their responds is of a different design, and the vault ribs are of a different profile in each bay. The walls of Calliope Court are of Boise stone in coursed ashlar. The surface presents an interesting irregular texture, resulting from sawing with shot and sand. Of a predominant light gray, the stone exhibits traces of a variety of warm, delicate colors. The southerly face of the battlemented square tower above the passage, with its adjoining stair turret, is reminiscent of Italian Gothic, yet without discord among its surroundings. The

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INTERIORS, STUDENTS' SUITES,-HARKNESS QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

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sculptured device above the double portal is that borne by the pendant upon the golden collar forming a part of the ceremonial regalia of the president of the university.

The last of these three courts, Brothers-in-Unity, may be reached from Library Street through Davenport Gateway, and from Branford Court through Eliot Gateway. Here the walls are of seven different sizes and five different colors of pressed brick, which have been brought to an agreeable soft color by sand-blast, and have also been treated for the removal of sharp edges and corners. They are laid in apparently haphazard fashion, as the various sizes may fit together with pieces of sandstone and limestone, taking up the bond at irregular intervals. In the upper part of the walls granite, carefully harmonized in color, is introduced. The seal of the society for which the court is named is placed in the low gable on the south side. The statue in the niche in the northwest angle is that of Noah Webster, author of the dictionary.

Opposite Eliot Gateway, on the north side of Branford Court, is the south portal of Dummer Gateway, which leads through Wrexham Court by a cloistered passage. Its north portal opens into Saybrook Court. The portals are vaulted and the intervening arcade of the cloister, which is early renaissance in character, supports an oak-timbered ceiling. The arcade and the trimming stone of Wrexham Court, as well as of Wrexham Tower, is gray Indiana limestone, and the granite walls are restricted to tones of gray. Over the entrance to Wrexham Tower, and suitably inscribed, is the stone sent from Wrexham Church. The outer face of the arcade is ornamented by sculptured symbolic heads, and in the angles at its ends are portrait busts.

Within the cloister, as terminals of the label mouldings of the late Tudor arches which open into the portals at either end, are playful humoresques carved in the form of bulldogs in varied guise. The pup with unruffled brow and wondering spectacled eyes represents the undergraduate. Beside him in football armor is the athlete, while on the opposite arch are the soldier and the graduate, the latter wise and important in cap and gown. Above each head is a sculptural key to the character typified below.

In Saybrook Court an increase in severity and scale of detail commensurate with the size of the court may be observed. The materials are seam-faced granite, trimmed with gray limestone in the south wall and Briar Hill sandstone elsewhere. Lower units and flat roofs to the south are contrasted with the highest buildings of the group on the other sides. The court is shaded by the largest elm within the Quad. Around a smaller central tree is a circular stone bench, and another bench stands against the wall of a high terrace across the easterly end. An arch at the base of the terrace stair in the southeast angle unites the terrace wall with the wall of a projecting gable.

NORTHERN COURTS

Wrexham Tower dominates this court and is echoed by other lesser turrets. Entrance from Elm Street is through Saltonstall Gateway, early renaissance in detail. An old millstone of historic interest forms a part of the path flagging in front of the terrace bench. This stone was first placed in the Lion Gardiner Mill, built on Saybrook Point in 1636. It was later transferred to another mill in the westerly part of the town. It was presented to the university by the selectmen of Saybrook, and removed to its present position in Saybrook Court in 1921.

Killingworth Court, in the northeast corner of the group, is similar to Saybrook Court in size and material, but different in general effect. A very low terrace wall divides it into two levels. The high screen wall on the south conceals the entrance to service-rooms below, and is continued into both southerly angles, unifying this elevation. On the easterly wall is a replica of the tombstone of Reverend Abraham Pierson, first rector of the college. Near the top of the stair tower in the northwest angle is a carved relief recalling the probable outlines of the parsonage which stood in that portion of the old town of Killingworth which is now the town of Clinton, where the Reverend Pierson gave the first instruction to students of the Collegiate School. Interesting grotesques crown the buttresses of the western wall, and high up in the southeast angle are the arms of John Davenport. In the pavement before Webster Entry is a millstone which was removed from a mill in Killingworth and replaced by a new stone when the mill was repaired to grind grain for the Continental Army of the Revolution. It was preserved at the ancestral Killingworth home of Everett E. Lord, who presented it to the university. Berkeley Gateway, the Elm Street entrance to this court, is early renaissance in style. In its vaulted ceiling worn red brick from a street pavement produces a surprising effect of antiquity and pleasant color.

All trees favorably located upon the entire plot were carefully preserved. Old trees, from sixteen to thirty-six inches in diameter, which occupied the sites of new buildings, were moved to new positions within the courts. A few failures attended this operation, but the preservation of so large a number of venerable trees has brought to the Quadrangle the atmosphere and dignity of age usually unobtainable for many years. The planting of the moats and courts has been designed and executed by Mrs. Beatrix Jones Farrand. The limitations of practical use and care, and of city conditions, are severe in landscape work of this character. Time must elapse before the ultimate effect present in the designer's mind can be attained, but the immediate results in this case form pleasing and appropriate adjuncts to the architectural scheme.

PLANTING

A typical suite of rooms consists of a study and two bedrooms, but this is varied as the plan permits by grouping a study with one or three bedrooms. Single rooms, combined study and bedroom for a single student, occur occasionally. The rooms are simple, strong, and notably masculine in character. Every study has a fireplace, its mantel and fittings varied in detail as becomes the scheme of the room. Some are faced with Tracon or Kasota stone, the American Travertines, and lined with brick and iron. Others are faced and lined with brown or green sandstone. The studies are wainscoted with oak to about 3½ feet in height, and generally the chimney breast is wainscoted to the ceiling. Wainscoting and other trim is of oak, stained to a light old brown in antique effect, all arrises and the projections of mouldings and carvings showing lighter, as if worn. The walls, above the wainscoting, and the ceilings, which are plastered directly upon the concrete floor construction, are of very rough texture, and are stained with Minwax in light browns and grays. The floors are of wide oak planks, showing the wrought nail-heads and the marks of the plane. The wall base throughout studies and bedrooms is of black slate.

INTERIORS

The wainscots are of various patterns, some in old English panels, others chamfered boards, others of alternate boards and moulded battens. Some are applied with exposed wrought-iron nail-heads. The woodwork is liberally embellished with carving, in which the sculptor has been permitted the free exercise of his imagination. The designs

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CLOISTERED PASSAGE, DUMMER GATEWAY.

DAVENPORT GATEWAY.

PIERPONT GATEWAY.

SALTONSTALL GATEWAY.

BERKELEY GATEWAY.

MATHER GATEWAY.

GATEWAYS, HARKNESS QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

(*Continued from page* 304.)

are ingeniously varied in the mediæval spirit, so that no duplication occurs in similar features. No study is without one or more generous window-seats, beneath which the radiators are mounted on a slate platform. The windows are set into the stone jambs and mullions and are without wood trim. All windows are iron casements swinging out, and the leaded panes bear an occasional grotesque or humorous picture, or the device of some old eating club or society. These window decorations, which are painted and fired into the glass, are drawn from old college publications, and record old Yale history and traditions, as well as contribute a quaint decorative character.

The numerous changes in plan, produced by the variations in the exterior architecture, combined with the changes in trim detail, produce an infinite variety of interiors, so that apparently there are no two rooms exactly alike. Conditions for which the woodwork has of necessity been specially designed frequently occur, and are utilized to obtain still further departures from typical effects. Their general character is such that age and use will improve, not mar, these rooms.

The bedrooms are as simple as possible, the woodwork being restricted to doors and to base and picture mouldings. The walls and ceilings are painted rough plaster. The floors are of narrow oak. Closets have cement floors flush with the top of the slate base, and are provided for all bedrooms.

In addition to the studies and bedrooms, four general meeting-rooms have been provided, to be known as Commons. These rooms have been designed in different quaint fashions, after old English precedents, and are named for old buildings which have been removed from the campus. They will be known as Athenæum, Cabinet, Lyceum, and Trumbull. Historic subjects are introduced throughout their design, and they are expected to develop new and beneficial elements in Yale undergraduate life.

The preliminary model and sketches were accepted in March, 1917, and the corner-stone was laid on October 7 of the same year, this being the two hundredth anniversary of the raising of the frame of the first college building in New Haven. The professional mind will appreciate what a task was accomplished by the architect in these seven months. Full-size profiles of belts from water-table to cornice, the sizes of buttresses, and the details of windows had to be determined and fixed immediately for the entire group, in order that foundation plans could be figured and stone cut for the lower courses. But it was accomplished, and only two changes were afterward made in constructed foundations.

CONSTRUCTION

Demolition of the extensive buildings on the site began July 20, 1917, excavation started September 22, and foundations were begun September 29, 1917. With the active entrance of the country into the war, construction was restricted, and finally ceased when protection had been afforded to the partially completed work. It was resumed June 6, 1919, and in less than sixteen months, starting from the first-floor level, the buildings south of Branford Court were completed and turned over to the senior class for occupancy on September 22, 1920. Between this date and June 18, 1921, the entire group of buildings and towers was finished, with the exception of the interior of the four Commons rooms and of the memorial rooms in the Harkness Tower, making it possible for the university to entertain in the Quadrangle rooms the official delegates to the inauguration of President Angell. The practical completion, above the first-floor level, of a structure of this size and of such unusual character in two years, is an accomplishment upon which builder and architect may be congratulated.

Already many competent critics have expressed enthusiastic appreciation. The students, including the seniors of 1921 who occupied the buildings south of Branford Court last year, are unanimous in their approval. But it is particularly gratifying to observe how strongly the Quadrangle appeals to the general public, who visit it in daily increasing numbers from all parts of this country and from foreign lands. Those who heard the tremendous applause which greeted the architect upon the receipt of an honorary degree at the Yale Commencement last June could not but be thrilled by this spontaneous and enthusiastic public tribute to architectural achievement.

PUBLIC APPROVAL

The Quadrangle has quickly taken its place in the affections of New Haven's people. It is already a cherished feature in the city's life. "The buildings stand, in the midst of traffic, a monument to the life of beauty, to the life of the spirit," writes Professor William Lyon Phelps, who gracefully expresses the common tribute of admiration when he says: "For my part, the Memorial Quadrangle gives me actual happiness every day of my life; for a thousand years to come it will educate, inspire, and civilize those who live within its enclosure and those who come to see it; century after century people will come from all over America to gaze at its mysterious and inspiring towers and walls, and no intelligent European will return from an American sojourn without having visited Yale. It is a joy and delight to me, a devout worshipper of beauty, to know that long after my bones are dust, long after I have left this planet, these gracious and lovely buildings will cast their charm over the coming children of men."

THE NAMES OF THE COURTS

BRANFORD. Named from the town near New Haven where ten ministers of the Colony met in 1701 to found the College.

SAYBROOK. The town where the Trustees organized in 1701, and where the college was first officially located and the first commencement exercises held.

KILLINGWORTH. The place of residence of the first Rector of the College, Reverend Abraham Pierson, in whose house the first students lived and received instruction.

WREXHAM. The forecourt of Wrexham Tower, so named from the town in Wales where stands the tower of St. Giles's Church, of which this tower is a modified copy. Near St. Giles's Church is the tomb of Elihu Yale.

LINONIA, CALLIOPE, and BROTHERS-IN-UNITY. Names given in honor of the three historic debating societies at Yale, whose best days are said to have been from 1800 to 1830.

THE NAMES OF THE GATEWAYS

No. 1. MEMORIAL GATEWAY. The principal entrance opposite the Campus and adjoining the Harkness Memorial Tower.

No. 2. PIERPONT. James Pierpont, pastor of the New Haven Church, 1685–1714; the college charter was secured chiefly through his leadership in 1701.

No. 3. LIVINGSTON. Colonel Philip Livingston, of Livingston Manor, New York, who had had four sons graduated here, made a gift of money in 1745, which was appropriated to the endowment of the earliest Professorship at Yale, that of Divinity.

No. 5. DAVENPORT. John Davenport, founder of New Haven in 1638; moved as early as 1648 for having a college here, which largely influenced the settlement of the Collegiate School in New Haven in 1716–17.

No. 6. ELIOT. Jared Eliot, of Killingworth, who was a graduate of the Class of 1706 and a Trustee from 1730–63, and by a bequest established the first permanent fund for the benefit of the Library.

No. 7. MATHER. Cotton Mather, of Boston. His letter to Elihu Yale in January, 1718, secured Yale's interest in the College, and suggested its being named for him.

No. 8. DUMMER. Jeremy Dummer, the Colony Agent in London, who interested Governor Yale in the College and collected large gifts for the Library.

No. 9. FITCH. James Fitch, of Plainfield, who, in October, 1701, made a generous offer of land and materials for the original buildings of Yale College.

No. 10. SALTONSTALL. Gurdon Saltonstall, Governor of Connecticut, was the agent chiefly prominent in fixing the College in New Haven in 1716–19.

No. 11. BERKELEY. George Berkeley, Dean of Derry and Bishop of Cloyne, in Ireland, gave his estate at Whitehall, near Newport, Rhode Island, as a foundation for graduate scholarships and undergraduate prizes, also nearly 1,000 books for the college library, in 1731–33.

THE NAMES OF THE ENTRIES

NUMBER	NAME	GRADUATE	CLASS	ACHIEVEMENT
1	BUSHNELL	David Bushnell	1775	Inventor of Torpedo and "Father of Submarine Warfare."
		Horace Bushnell	1827	Theologian and Preacher.
2	CALHOUN	John Caldwell Calhoun	1804	Vice-President of the United States.
3	COOPER	James Fenimore Cooper	1806	Novelist.
4	CUTLER	Manasseh Cutler	1765	One of the Authors of the Ordinance of 1787, Botanist, etc.
5	DANA	James Dwight Dana	1833	Geologist and Mineralogist.
6	DICKINSON	Jonathan Dickinson	1706	First President of Princeton College.
7	DWIGHT	Timothy Dwight	1769	President of Yale College.
		Timothy Dwight	1849	President of Yale College.
8	EDWARDS	Jonathan Edwards	1720	Theologian and Metaphysician.
9	EVARTS	William Maxwell Evarts	1837	Leader of the American Bar and Secretary of State.
10	GALLAUDET	Thomas Hopkins Gallaudet	1805	Founder of Deaf-Mute Instruction in America.
11	GIBBS	Josiah Willard Gibbs	1858	Discoverer and Interpreter of the Laws of Chemical Equilibrium.
12	GILMAN	Daniel Coit Gilman	1852	First President of Johns-Hopkins University.
13	HALE	Nathan Hale	1773	Patriot Spy of the Revolution.
14	HUMPHREYS	David Humphreys	1771	Washington's Aide, Diplomat, and Man of Letters.
15	JOHNSON	Samuel Johnson	1714	First President of King's, now Columbia, College.
		William Samuel Johnson	1744	One of the Framers of the United States Constitution and President Columbia College.
16	KENT	James Kent	1781	Author of Kent's "Commentaries on American Law."
17	KING	Clarence King	1862	Founder of the United States Geological Survey.
18	LOOMIS	Elias Loomis	1830	Authority on Meteorology.
19	MASON	Jeremiah Mason	1788	Leader of the New England Bar.
20	MITCHELL	Donald Grant Mitchell	1841	Author.
21	MORSE	Samuel Finley Breese Morse	1810	Inventor of the Electric Telegraph and Artist.
22	SEABURY	Samuel Seabury	1748	First Bishop of the American Episcopal Church.
23	SILL	Edward Rowland Sill	1861	Poet.
24	SILLIMAN	Benjamin Silliman	1796	Pioneer in Scientific Education.
25	STILES	Ezra Stiles	1746	Antiquarian, Scholar, and President of Yale College.
26	SUMNER	William Graham Sumner	1863	Sociologist and Economist.
27	SWIFT	Zephaniah Swift	1778	Chief Justice of Connecticut and Author of "Swift's Digest."
28	TAFT	Alphonso Taft	1833	Attorney-General and Secretary of War.
		William H. Taft	1878	President of the United States.
29	TILDEN	Samuel Jones Tilden	1837	Governor of New York and Democratic Candidate for Presidency.
30	WAITE	Morrison Remick Waite	1837	Chief Justice of the United States.
31	WEBSTER	Noah Webster	1778	Lexicographer.
32	WHITE	Andrew Dickson White	1853	First President of Cornell University.
33	WHITNEY	Eli Whitney	1792	Inventor of the Cotton Gin.
		Josiah Dwight Whitney	1839	Geologist.
34	WILLIS	Nathaniel Parker Willis	1827	Poet and Man of Letters.
35	WINTHROP	Theodore Winthrop	1848	Patriot and Author.
36	WOLCOTT	Oliver Wolcott	1747	Signer of the Declaration of Independence.
		Oliver Wolcott	1778	Secretary of the Treasury under Washington.
37	WOOLSEY	Theodore Dwight Woolsey	1820	President of Yale College and Eminent Scholar.

Carved band in Davenport Gateway.

A General Survey of the Mechanical Equipment
of the Harkness Memorial Quadrangle

By Cornelius J. Davis
Engineer in Control of Heating, Plumbing, and Electricity

THE mechanical equipment at the Quadrangle is controlled in the pump and service rooms.

Due to the architectural treatment of the buildings and its many passages, it was necessary to run the mains through three tunnels radiating from the pump-room, and rising at four points to the basement ceilings, there distributing to the various buildings.

This divided the group into four units, and the valving is so arranged that it is possible to control independently any unit, building, section, or riser.

Details of the three types of toilet-rooms and the numerous combinations of fitting that might be used by the plumber or steam-fitter were carefully worked out in advance, so that it was possible to complete the concrete floor slabs with the necessary holes in same in advance of the roughing in.

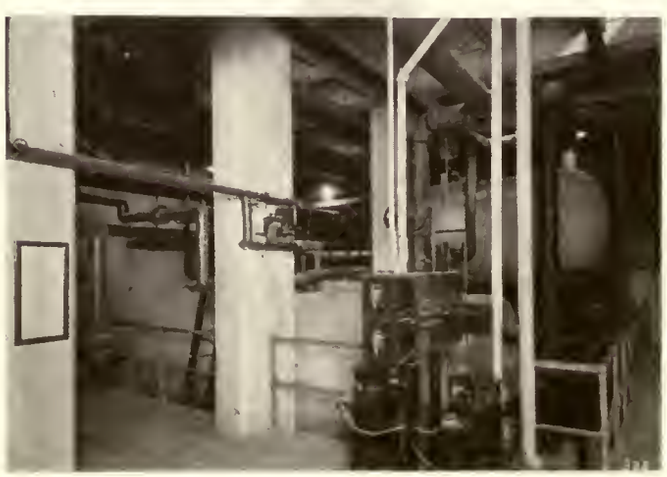
The combination of slop-sink closet, shower and water-closet stalls were so designed as to eliminate all unnecessary exposed metal in their construction. Wall-hung water-closet and lavatories were installed. All exposed metal, including faucets, shower-head accessories, electric-switch plates, and hardware in all toilet-rooms are "Benedict Nickel," except piping under the lavatories, which is "Saxo White" finish.

No bathtubs are used in any of the buildings.

Brass pipe is used throughout for the water system, and the hot-water storage-tanks are solid-copper shells. Gravity-circulating hot-water system is installed with auxiliary circulating pumps to start circulation in the morning.

Two six-inch connections are made to the street water-mains—one in Library Street and the other in High Street—to insure a continuous supply of water to the Quadrangle. The street supplies connect with the suction-tank, and from there the water is pumped into the two house tanks, one located in the Harkness Tower and the other in the Wrexham Tower. The down supply from each tank is cross-connected in the basements with a distributing main that circles the group. Concealed flush valves are used with a special three-inch push-button set in the wall behind the water-closets. A gentle push with the shoulder will flush the closet.

Slow-closing faucets are used on all lavatories to save wasting of water, the flow being regulated so that it is possible to wash your hands under running water. The cold-water faucet flows about four times as long as the hot when released.



Under basement floors extra-heavy cast-iron pipe was used. The court drainage system is constructed of extra-heavy cast iron to prevent the roots of the trees filling the pipe in a few years, as is the case when tile pipe is used.

The low-pressure vacuum steam-heating system, in addition to the general scheme of control hereinbefore described, is divided into three systems, known as regular, secondary, and special.

The regular system controls one radiator in each study, bedroom, and upper stair halls; the secondary system controls one radiator in each study; and the special system controls toilet-rooms and first-story stair halls, so that it is possible for the engineer to regulate the amount of heat in each suite according to season of the year.

The steam for heating the buildings and the hot water in the storage-tanks is supplied through one fourteen-inch low-pressure and one ten-inch high-pressure main from the university's power-house.

Ventilation in the toilet-rooms is accomplished by louvers in the sill of the metal window-frames and a vent shaft heated by the hot-water risers located near slop-sink closet.

All windows have louvers and each study a fireplace, which creates a natural ventilation. Where it was not possible to have a fireplace in a study or single room, a vent register was installed.

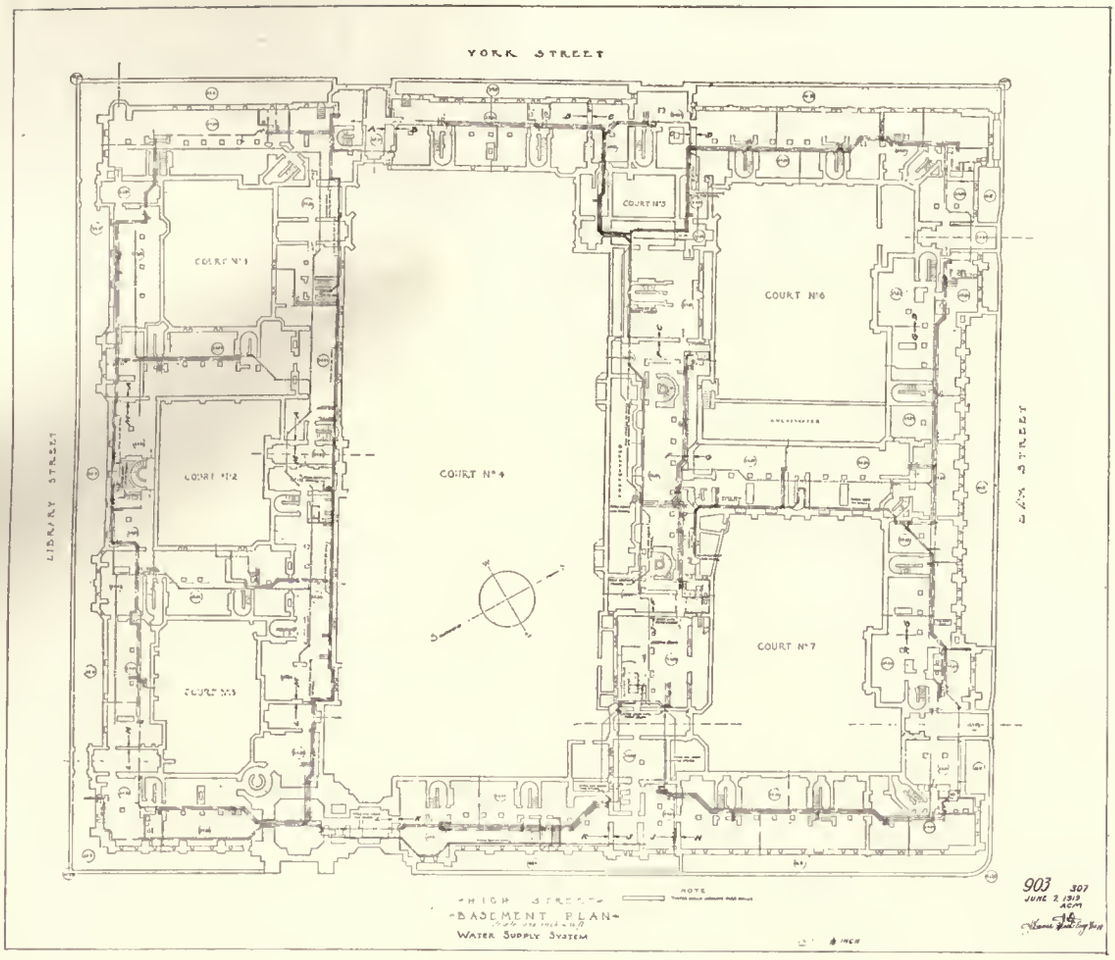
The electric lights and power of the Quadrangle are controlled from the main switchboard located in the service-room, with one or more panels in each building, according to the size. (I might mention here that during construction the Quadrangle was divided into eleven buildings.) Each panel is divided into three parts or systems, designated as "A," "B," and "General," which also includes "D" circuits.

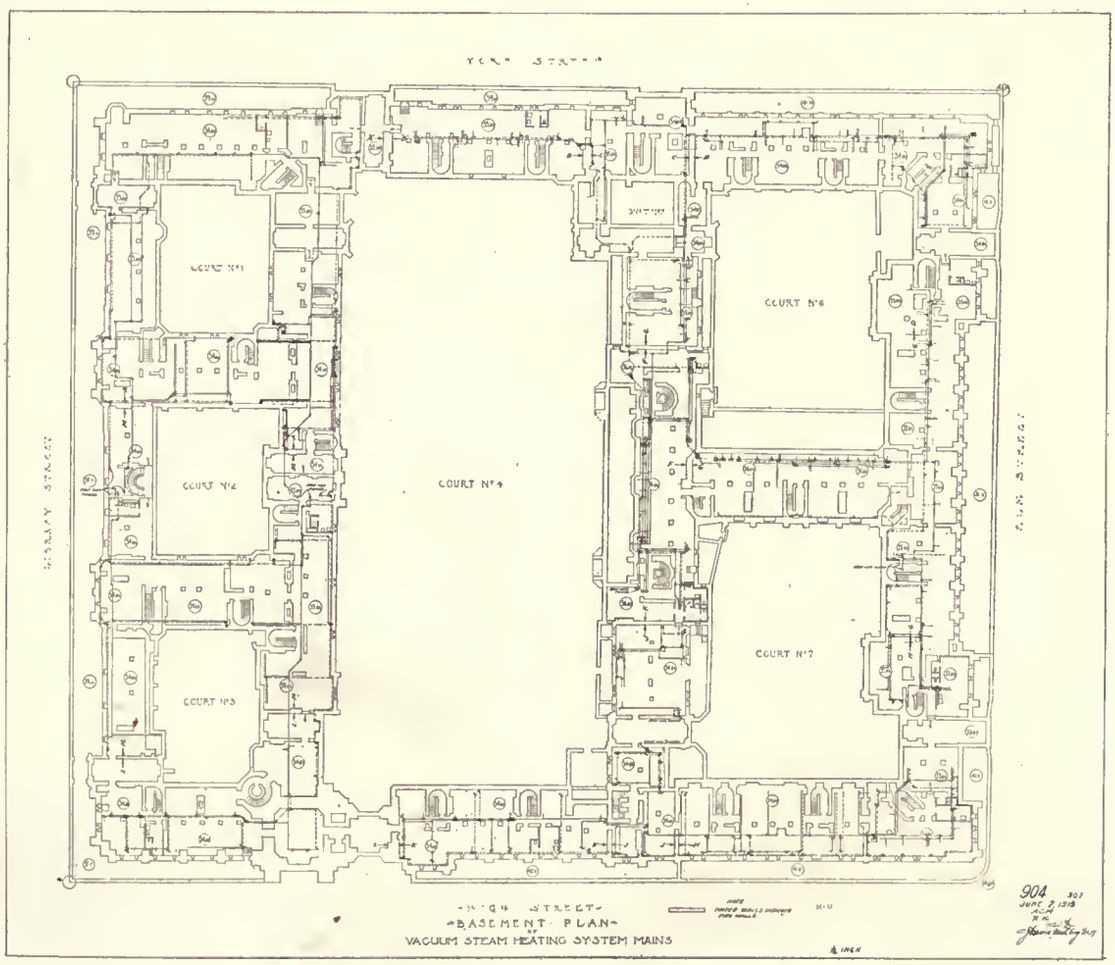
The "General" system controls the branch circuits feeding the fixtures and receptacles in each suite. The "D" circuits control those lights that burn continually in stair halls and corridors. The "A" system controls lights in stair halls and one ceiling light in toilet-rooms that burn from sundown to sunrise. The "B" system controls brackets and one ceiling light in toilet-rooms that burn until 10 P. M. The exterior lighting of the Quadrangle and lights over entries are divided into two groups, each controlled by a time switch. One set of power feeder consisting of two five-hundred-thousand circular mils and two lighting feeders each consisting of two one-million and one five-hundred-thousand circular mils cables, supply current to the Quadrangle.

Each set of lighting feeders carry one-half of the load with the "A" and "B" systems cross-connected on the main switchboard, so that all toilet-rooms, stair halls, and corridors can be fed by either set of mains.

Every panel in the group is equipped with an emergency feeder.

The Quadrangle has a number of fire passages, and the lighting of them is so controlled that if a door to any fire passage is opened it throws in a remote control switch located in the service-room, which in turn lights the fixtures in that particular passage, closes the circuit in annunciator which indicates the number of the fire passage, and sounds an alarm. The continual opening and closing of the doors in the passage after the circuits have once been closed does not affect the lights until the switch is reset by the engineer.


YORK STREET
LIBRARY STREET
COURT No 1
COURT No 2
COURT No 3
COURT No 4
COURT No 5
COURT No 6
COURT No 7
903 307
JUNE 2, 1919
ACM
HIGH STREET
BASEMENT PLAN
WATER SUPPLY SYSTEM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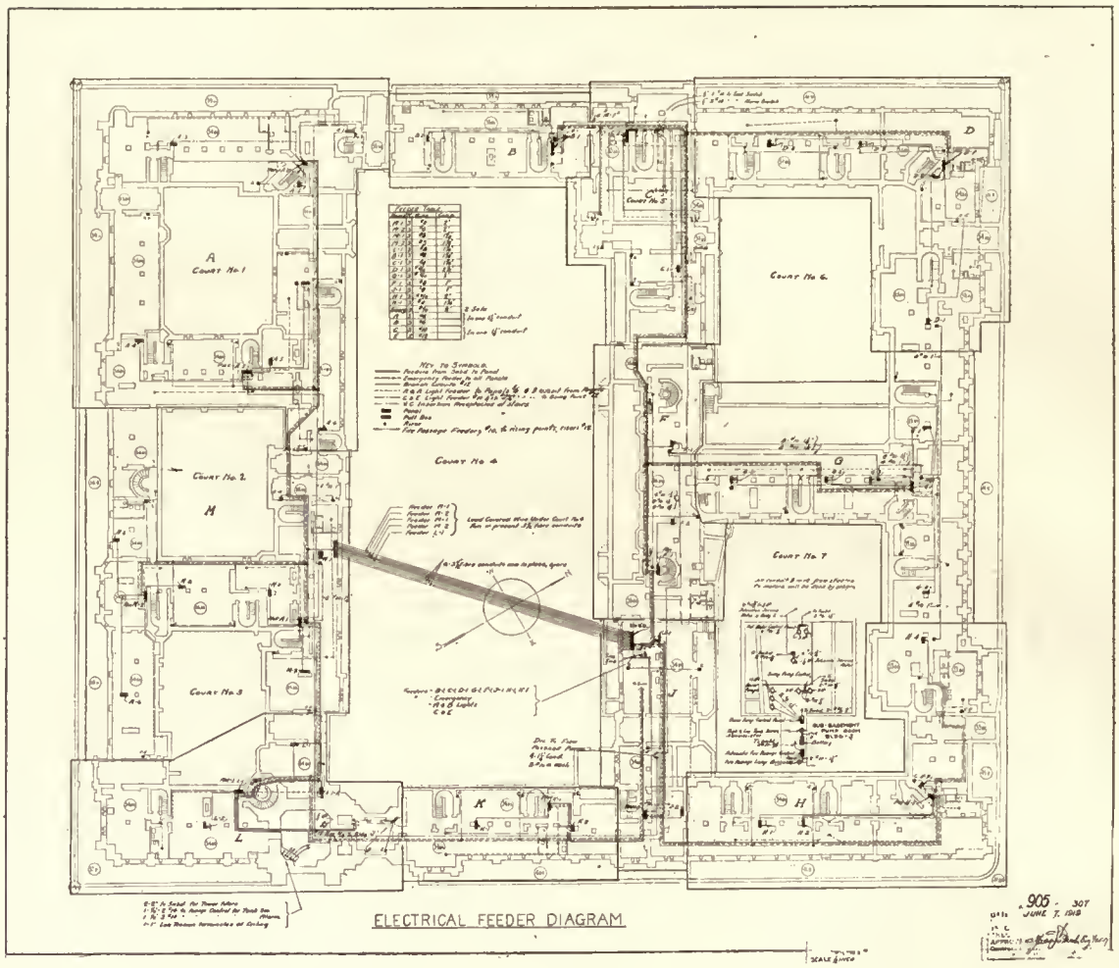
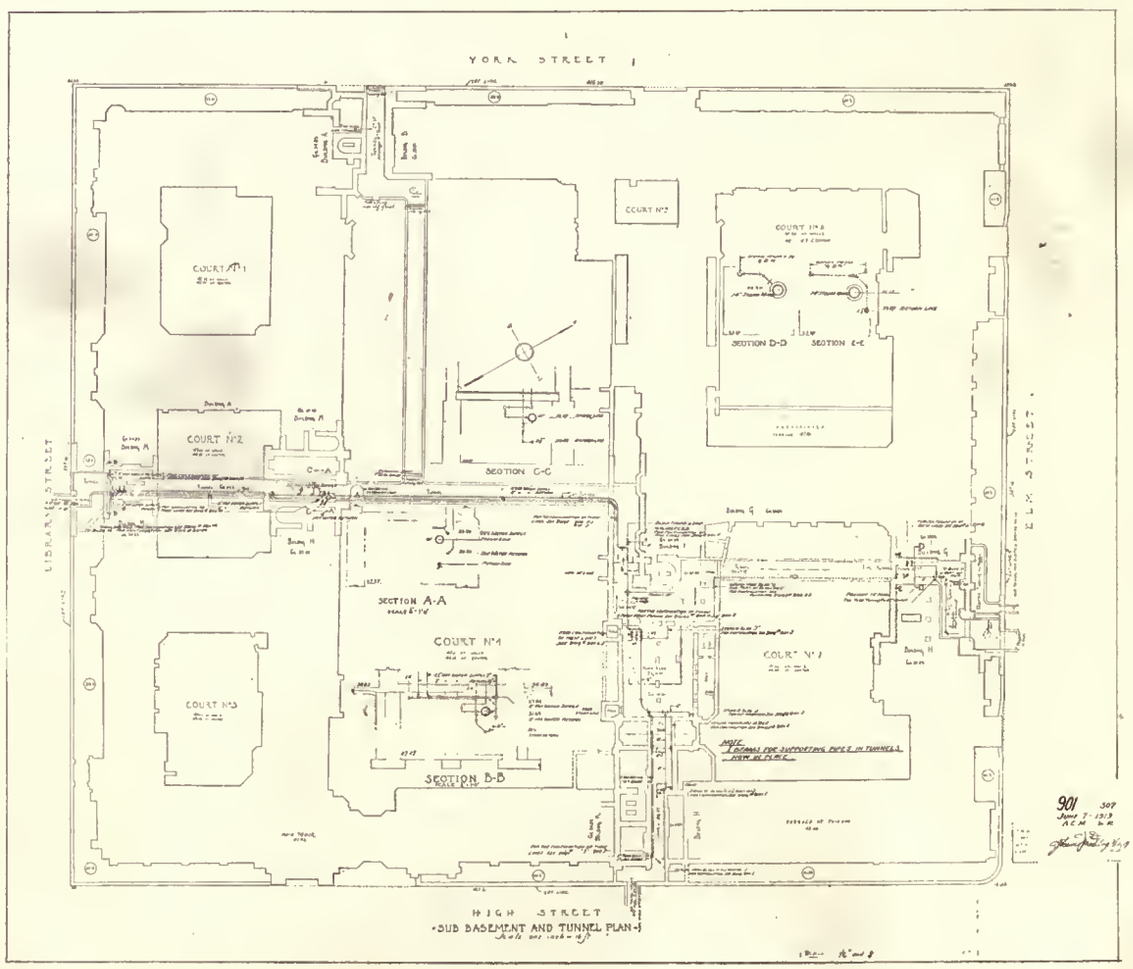
BASEMENT PLAN
VACUUM STEAM HEATING SYSTEM MAINS


ELECTRICAL FEEDER DIAGRAM
905 - 307
JUNE 7. 1913


YORK STREET
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ELM STREET
COURT No 1
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COURT No 3
COURT No 4
COURT No 5
COURT No 6
COURT No 7
COURT No 8
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SUB BASEMENT AND TUNNEL PLAN
901
307
June 7 1913

Structural Features

By Adolph F. Bernhard
Engineer in Control of Construction

CONCRETE pier foundations extending to bed-rock under the Harkness Tower, specially treated adjoining foundations, large pipe tunnels under the basement-floor levels, cantilever stone stairs, intricate steel-framed pitched roof and reinforced hollow-backed gypsum roof blocks are the principal structural features of the beautiful group of dormitory buildings forming the Memorial Quadrangle at Yale University at New Haven.

The underlying soil consists of sand and gravel extending thirty or more feet below grade. A great deal of this excavated material was used in mixing with mortar and concrete. Seepage or ground water was not encountered except under the pump-room, a space some eleven feet below the floor level of pipe tunnels which lead to and from this point under the courts and crossing the buildings, finally extending also under three of the four streets surrounding the Quadrangle. The tunnels for pipe mains for heating, electricity, and some plumbing are about eight feet wide and seven feet high, built of reinforced-concrete walls and roofs, having a number of manholes opening to courts and basements for inserting additional piping and other manholes for ventilation. They contain the main steam-piping supplying heat from the main power-plant several blocks away, not only to this group of buildings but to others belonging to the university in adjoining blocks. Main hot-water supply-pipes are also run in these tunnels from the pump-room to various points in this group, and numerous electric mains in fibre conduits encased in concrete extend along, but outside of the tunnels are provided with separate manholes.

All the buildings have spread foundations built of concrete usually with two, three, or four stepped courses, which were reinforced with steel bars under heavily loaded points. The sizes of all footings were carefully calculated so that the bearing on the soil is equal on each square foot. Considering the different levels, such as at tunnels, at which these foundations had to be laid, and considering also the various heights of adjoining buildings and towers, the results have been most satisfactory.

The Harkness, or main, Tower, two hundred and sixteen feet high above grade, is supported on round concrete piers at the corners extending to bed-rock found about ninety feet below grade. These piers were sunk by the pneumatic-caisson process and were topped off under the basement floor with a concrete mat five feet thick reinforced in all directions with steel bars and which extends to the outer line of the tower buttresses. As one side of the arched Memorial Gateway was to be supported on this outer foundation, it was deemed advisable to support the other side on similar but not so deep supports. Concrete piles were designed for this, connected at the top with the above-mentioned heavy mat by means of reinforced-concrete beams. Other adjoining footings were loaded down before the foundation walls were built on them, to avoid possible future settlement, which method has proved efficient and wise, as no defects from this possible cause have become apparent.

One interesting method preventing cracks between the Harkness Tower and the adjoining buildings was used that is the reverse of the usual practice. To prevent unequal settlement caused by the compression of soil under the foundations, the foundation of buildings next to the tower were laid in the fall and loaded with an excessive load of pig iron and allowed to stand thus all winter in order that the soil would be as non-compressible as the stones under the tower.

Evidently this operation was successful, as so far no cracks after two winters have appeared.

The outside walls of all buildings below grade were built of rubble-stone, while the inside walls and piers are of brick. Above grade the walls are of brick faced outside with granite or stone ashlar and treated inside with a damp-proof compound before being furred with hollow terra-cotta blocks. All columns and the construction of all floors and flat roofs are built of reinforced-stone concrete, including beams, girders, and lintels over openings in walls. Terra-cotta blocks are used for all partitions, and solid brick walls at frequent intervals divide the interior into smaller units for additional fire protection. All window frames and sash in masonry walls above the basement are of iron cast in one piece.

In order to carry out the architectural tapering design of the towers, heavy reinforced-concrete girders were formed around them at the floors and united with the beams and slabs in the floors to form proper supports for the offsetting walls. Substantial anchors were also used to secure the walls above and below these points. A trestlework of steel beams is used to support the chime of ten bells that will be installed in the belfry portion of the main tower. Two of the towers contain large steel water-tanks placed at the same elevation and which are cross-connected in the basement.

There are thirty-nine sets of stairs distributed in the buildings, varying in height from one to eight flights. They are all built of solid American travertine stone and have continuous bevelled soffits. Most of these stairs have their steps built into the wall at one end only, on the cantilever principle, the other end being free and supporting a wrought-iron balustrade and wood hand-rail. All stair halls are lined with warm-colored rough-face brick and their floors are paved with darker brick. All living-rooms have oak floors laid on damp-proofed sleepers. Toilet-rooms have tile floors.

Stair hall in Cooper Entry.

Numerous stone bay windows used for architectural effect throughout the buildings presented many difficulties in designing their supports and anchorages. Generally they are provided with steel supports concealed in their bottom corbels and fitted with various

cantilever devices connected or built in with the main walls and floor construction. At the upper levels the floor construction usually extends out sufficiently to support the bays.

The pitched roofs covering most of the buildings, together with the smaller dormers, are constructed of steel framing, all riveted and bolted and securely anchored to the masonry walls and concrete floors. This framing is spaced up to seven feet apart, and is spanned with reinforced hollow-backed gypsum roof blocks eighteen inches wide. These blocks were made specially for this work of dense gypsum to insure the holding power of nails driven into them. The blocks were five inches high and had a minimum thickness of three and one-half inches. Each block was secured to the steel framing and all joints were pointed full with gypsum. In specially complicated places the gypsum was cast in place on temporary wood forms. Steel collar beams were used in these roofs to brace the rafters and to form the flat portion of metal furred and plastered ceilings in the upper rooms. These roofs were covered with a heavy ply of asphalt felt and then finished with specially made terra-cotta shingle tile of various colors, chipped on all exposed edges and varying in size and thickness. The tile were secured to the gypsum blocks beneath with copper-wire nails. The varying architectural designs of these roofs presented many difficulties in designing and detailing of the steel framing, as in scarcely any place were the members on both sides of the same roof opposite each other or symmetrical. Other difficulties to overcome were various locations of chimneys and of interior supports, besides the limitation of spacing for gypsum blocks. The steel was so carefully detailed, however, that the work of erection proceeded with hardly any refitting.

The Builder's Concept of the Construction of the Memorial Quadrangle and Harkness Tower at Yale University

RUSKIN has stated that no good work can be perfect and that the demand for perfection is always the sign of a misunderstanding of the ends of art. For since the architect, whom we would assume capable of executing his work perfectly, cannot do so with his own hands, he must either make slaves of his workmen, in the old Greek fashion, levelling his work to the workmen's capability and thereby degrading it, or he must take his men as he finds them, letting them demonstrate their weakness as well as their strength. This will result in Gothic imperfection but render the whole as noble as the intellect of the age can make it, paradoxical though that may seem.

Fundamentally, this principle was the key-note of the sympathetic understanding between the architect, the builder, and the artisans which has been expressed in the edifices forming the group of buildings known as the Memorial Quadrangle and Harkness Tower. The creative handiwork of the craftsman and mechanic is in evidence throughout the constructive and decorative treatment of the buildings. In fact, the true spirit of the old Gothic builders dominated everything.

The chronological record of the progress on the work indicates that the demolishing of the former buildings on the site (namely, Pierson Hall, Peabody Museum, Herrick Hall, otherwise known as the old "Gym," and others) was started July 20, 1917, the actual excavation was begun September 22, the foundation started September 29, and the corner-stone, at Building M, laid October 8, 1917, at Library and High Streets.

When America became actively engaged in war, the donor, feeling that it was unpatriotic to use men on this work when they were so urgently needed by the country, directed that the operation cease. It was not resumed until June 6, 1919, but by September 22, 1920, the whole unit facing Library Street was turned over to the university.

SPEEDING UP THE WORK IN WINTER

For two successive winters, 1918–19 and 1919–20, we were engaged on exterior masonry, such as pouring reinforced stone concrete floor slabs, beams and columns, building walls, setting roofs, etc., and to suit the variable weather organized a gang of 65 masons and tenders so as to work them outdoors when the weather permitted, and indoors when it did not permit. All of our concrete and mortar were machine-mixed outdoors, and each machine was equipped with a heater. We never lost any material through freezing, for we covered all work with tarpaulins, erected temporary doors with muslin window-enclosures, and turned on steam underneath. The winter of 1919–20 was the severest in the recollection of any living resident—severe cold and an unusual amount of snow. None of our help lost one minute from these causes. At times such material as was hauled was done by four-horse teams, due to snow in the streets. About 30,000 feet of cut-stone trim was hauled from New York on motor-trucks during this period. We had an emergency gang, whose job it was to report at 6 A. M. if snow fell overnight, or on Saturdays and Sundays to remove same from scaffolds and sidewalks. On one Sunday we had ten double trucks hauling snow from the premises. At the time of the Junior Prom the university was swamped, and called on us to remove snow from in front of Woolsey Hall, where the Prom was held. (We had ten 3-ton trucks on this work for ten hours.)

One of the great problems in a building operation of such magnitude was the inspection and supplying of materials in the quantities and sequence that should meet the schedule planned by the field superintendent, in order to minimize the loss of time and expense as far as possible.

TRANSPORTATION WAS A DIFFICULT PROBLEM

As most of the material for these particular buildings was of a special design and manufactured all over the United States, some coming from as far south as Alabama, as far west as Boise City, Idaho, and as far east as New Hampshire, the transportation item became a very serious problem. We all know what a chaotic condition the railroads of the country were in, and especially during the years 1918, 1919, and part of 1920. The lack of rolling-stock, poor equipment, together with the many strikes in freight terminals and lighterage departments, made the period one of the greatest difficulties.

The freight departments of the different railroads issued embargoes against one another and to connecting lines on their own railroad, on account of the accumulation of freight and the congestion which occurs at all freight terminals and junction points. This necessitated obtaining permits to ship to any point in the country, and was especially strict for all New England points on account of the poor facilities.

These embargoes made it necessary not only for us to act as traffic-manager for our own material but also for each and every subcontractor, and in many cases for plants which were fabricating material for our subcontractors.

To obtain these permits we had (in a great many cases) to secure them from at least two railroads on account of material either being fabricated on or routed over one or the other roads.

We also had to obtain permits in many instances for the shipment of the basic material from plants under contract with our subcontractors in order that we could obtain the finished product on time.

These permits were issued to us calling for from 1 to 15 cars, and in several cases permits were obtained for full train-loads of 50 cars.

When a permit was sent to a plant it again necessitated us sending a man to that territory in order to get the allotment of cars allocated by permit, and the loading of same before the expiration of said permit, which in most cases was only good for one week. We would ride the cars through keeping in touch with the train at all junction points so that it would not be split up and cars set off on account of the different classification orders issued at the various freight terminals. This meant a man on the road night and day, and, in many instances when breakdowns would occur to cars, following them on to the repair track or shop, and staying with such cars until they were repaired and moving again.

Statistics are tiresome, but it may interest the reader to know that in these buildings there have been utilized almost 7,000,000 common brick, including those from the demolition of old buildings that lend so much richness of color and flavor of antiquity where they have been used, 635,000 face brick, 170,000 square feet of stone ashlar, 41,000 barrels of cement, 350,000 square feet of partition, 125,000 cubic feet of cut stone, 57,000 square feet of cement paving in the basement, 26 miles of electric conduit, and 70 miles of electrical wire. There are 63,000 feet of steam-pipe, 1,650 radiators, 31,000 square feet of radiation, 3,500 valves, 33,000 feet of brass pipe for hot and cold water, over 3,700 windows, some 60,000 panes of glass.

SOME STATISTICS

The varieties of stone used in the Quadrangle will at least give some idea of the forethought and care devoted to these details. There was no haphazard selection, but every kind of stone—in fact, almost every individual bit of stone—was selected with the thought of its relation to the completed wall, vault, or archway in which it was to take its ordered place.

Exterior Trim: 85,000 cubic feet of Briar Hill sandstone from Glenmont, Ohio. 15,000 cubic feet of variegated limestone from the quarries in Bedford, Ind. 2,500 cubic feet of Boise stone from quarries at Boise City, Idaho. 500 cubic feet of Kingwood sandstone from quarries at Kingwood, Va. *Interior:* Approximately 190 shower-stalls and toilets, all of French-gray Missouri marble from Carthage, Mo. *Mantel Facings:* Approximately 305 made of the following: Tracon stone from Winona, Minn., Kingwood stone from Kingwood, Va., Kasota stone from Minn., Dorchester stone from Dorchester, Nova Scotia, Connecticut, brownstone from Portland, Conn. In each of 1,350 rooms, spaces, and showers, slate bases from Pen Argyl were used. *Memorial Room:* Approximately 3,000 square feet of Kato stone for the walls and fan vault in ceiling. *Interior Stair:* Approximately 14,000 cubic feet of Tracon stone from Winona, Minn., in 39 stairways. *Field Work:* Approximately 150,000 square feet of Plymouth Seam-Face granite from Weymouth, Mass. Steps to exterior doors of Stony Creek granite from quarries at Stony Creek, Conn.

Mr. F. S. Sutton himself, an expert stonecutter associated with the work and familiar with Old World traditions, and with the fascinating story of the master craftsmen of the great Gothic periods, emphasizes the fact that in all the work of the Quadrangle where intricate and delicate stonecutting was to be done, not only the hand of an expert was required but as well a mind that found inspiration and pleasure in the work. All of the stonecutters associated with the Quadrangle were men chosen for their special skill, and the spirit and atmosphere in which they worked was that of the days long before the age of machinery and mechanical cutting of ornamental stone. Mr. Sutton says that the moral effect upon the men working upon the Quadrangle was inspiring and uplifting. There was a unity of interest and a pride in the perfection of each man's work rarely shown in these modern days. He expresses his own pride in being connected with what he speaks of as "an unequalled example of Gothic building."

Announcements

A Rival of the Bush Building.—The new Wrigley office-building in Chicago is a veritable jewel at night that stands out against the dark sky like a sentinel clothed in snow-white, guarding all approaches to the city. The entire front of the building and four sides of the tower are flood-lighted with twenty million candle-power supplied by batteries of powerful X-ray reflectors.

George Feltham, architect of St. Petersburg, Florida, has opened a branch office in Clearwater, Florida, and requests samples, catalogues, etc., for his files.

Geo. W. Packer, Jr., architectural engineer, announces that he has established offices at 15 West 10th Street, Kansas City, Mo. He will continue the practice of architecture and architectural engineering, after years of service with the National Engineering Service Corporation of Illinois, and the Kansas City Southern Railway Company in their general offices, Kansas City, Mo. Catalogues requested.

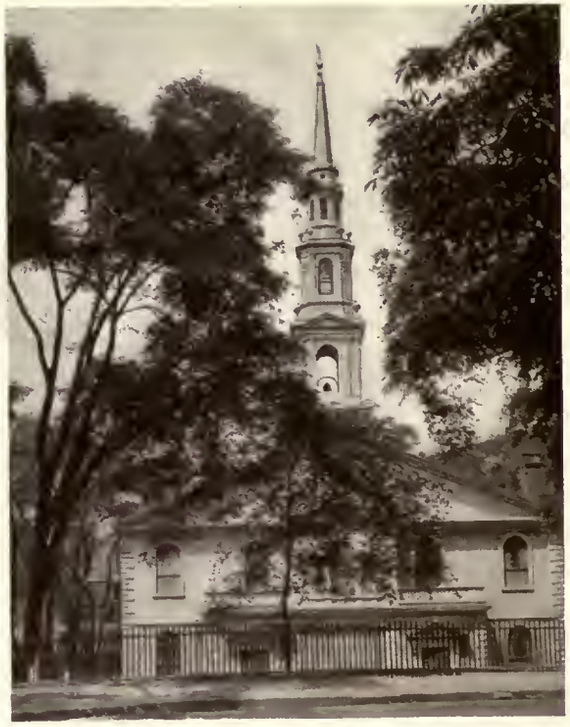
The H. H. Winner Company, bank architects and engineers, announce the removal of their offices to more commodious quarters, second floor Cunard Building, 503 Market Street, San Francisco.

Frank H. Quinby, architect, announces that he has moved into new offices at 110 William Street, New York City.

The offices of Walter Thomas Williams, architect, have been removed from 151 Fifth Avenue to 41 East 42d Street, New York City.

Hamilton Harlow wishes to announce his withdrawal from the firm of Dow, Harlow & Kimball, architects and engineers. He will continue the practice of architecture under the name of Hamilton Harlow, Architect, with offices at 1388 Massachusetts Avenue, Harvard Square, Cambridge, Mass. Manufacturers' samples and catalogues are desired.

AVON, CONN.



PROVIDENCE, R. I.

RINGE, N. H.

BEDFORD, MASS.

LEXINGTON, MASS.

CONCORD, N. H.

A GROUP OF OLD NEW ENGLAND CHURCHES.

Robinson, author of "Old New England Doorways" and "Old New England Houses."

Architectural Design by the Use of a Module

By Ernest Flagg

Author of "Small Houses—Their Economic Design and Construction"

ARCHITECTURAL design by the use of a module, or fixed unit of measure, requires a peculiar habit of mind not fostered by common methods of teaching. It is a habit that can only be acquired by practice of a kind which few architects have had. The composer of music or poetry works to a measure to obtain harmony, and there can be little doubt that measure is necessary in architecture if the highest results are to be attained. Is not proportion in architecture harmony of dimensions, and how can one be sure of obtaining harmony of that sort without a scale to work by? In the highest type of architecture which the world has ever known the fixed unit governed. That Grecian Doric temples were designed to a module, and that that module was the spacing of the triglyph, the buildings themselves prove. For more than two thousand years design by this method has been practically a lost art. It is an art which should be revived, and a study worthy of the most profound consideration, but upon which the schools are silent.

Laying out the work on the ground.

It is almost universally admitted that certain combinations of dimensions produce pleasing results, but since the time of the ancient Greeks no attempt has been made to formulate a consistent system of design based on that knowledge. Some scoff at the idea that the fixed unit is necessary to obtain harmony, or that it may even serve as an aid in so doing. They argue that inasmuch as the work would be seen in perspective, the unit would be lost, but they deceive themselves, for the unit too is seen in perspective, and is by no means lost. The universal admiration which Greek proportions have always excited proves that the method used in obtaining them was correct.

It seems, indeed, too evident to need argument that one who uses in geometric design only such combinations of measure as are known to produce harmony should have a great advantage over him who depends on chance or guesswork for his results.

It is reasonable to suppose that when a fixed unit is used in harmonious combinations that the best and most striking effects would be had where that unit is seen or felt, like the measured beat in music or the cadence and rhythm in poetry.

That the Greeks thought so is sufficiently evident by the care which they always took in Doric buildings, to mark the scale on the work by the triglyphs. In other buildings of a later date, where doubtless, too, a module of some sort was used, perhaps they thought that the scale was sufficiently indicated by the features and details whose placing and spacing were governed by it.

When using a module in architectural design, one necessarily accentuates the measure by its very use. Every feature being governed in its placing by the module becomes a reminder of the module's presence. As the regular unit exists everywhere throughout the composition, one uses it naturally and instinctively for all things requiring regular spacing. Just as all the greater dimensions are fixed by the unit and combinations of it, so also all minor spacing is obtained by subdivision of it. Balusters, frets, and all other kinds of running ornament, antefixes, cresting, modillions, beam and rafter spacing, and every other minor division of the sort, are most conveniently and naturally placed by subdividing the module. Thus, everywhere throughout the design commensuration and harmony both in the lesser and greater dimensions reign, simplifying and unifying the work. Such should indeed be the results; whether they are attained or not depends on the ability of the designer. Of course it is not contended that the mere use of a system of any sort is sufficient for the production of a work of art. To do that requires much more than can be supplied by theory or technic. The module will not endow the mediocre man with genius. He will be mediocre still, though he may do better than without it, but in the hands of the master it may become a tool of priceless worth.

It is not only in the higher branches of his art that the module may be of great service to the architect. For purely practical reasons the value of commensurability in all parts of the design cannot be exaggerated. One who has never experienced its benefits can form little idea of its usefulness. Without it a full standardization of parts is impossible. Where commensurability of dimensions does not exist special cases must abound, and special cases are the opposite of standardization. In making any design not governed

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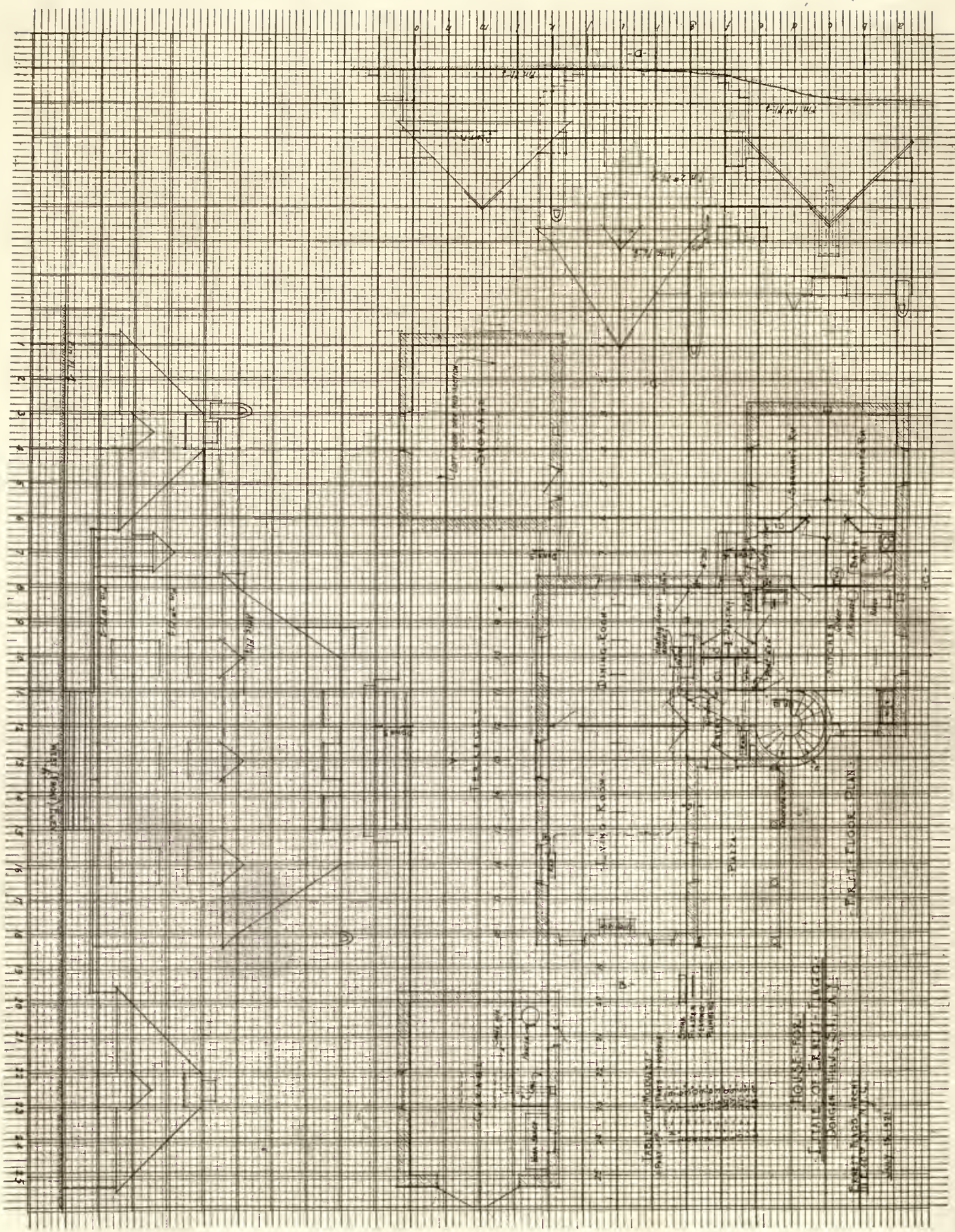
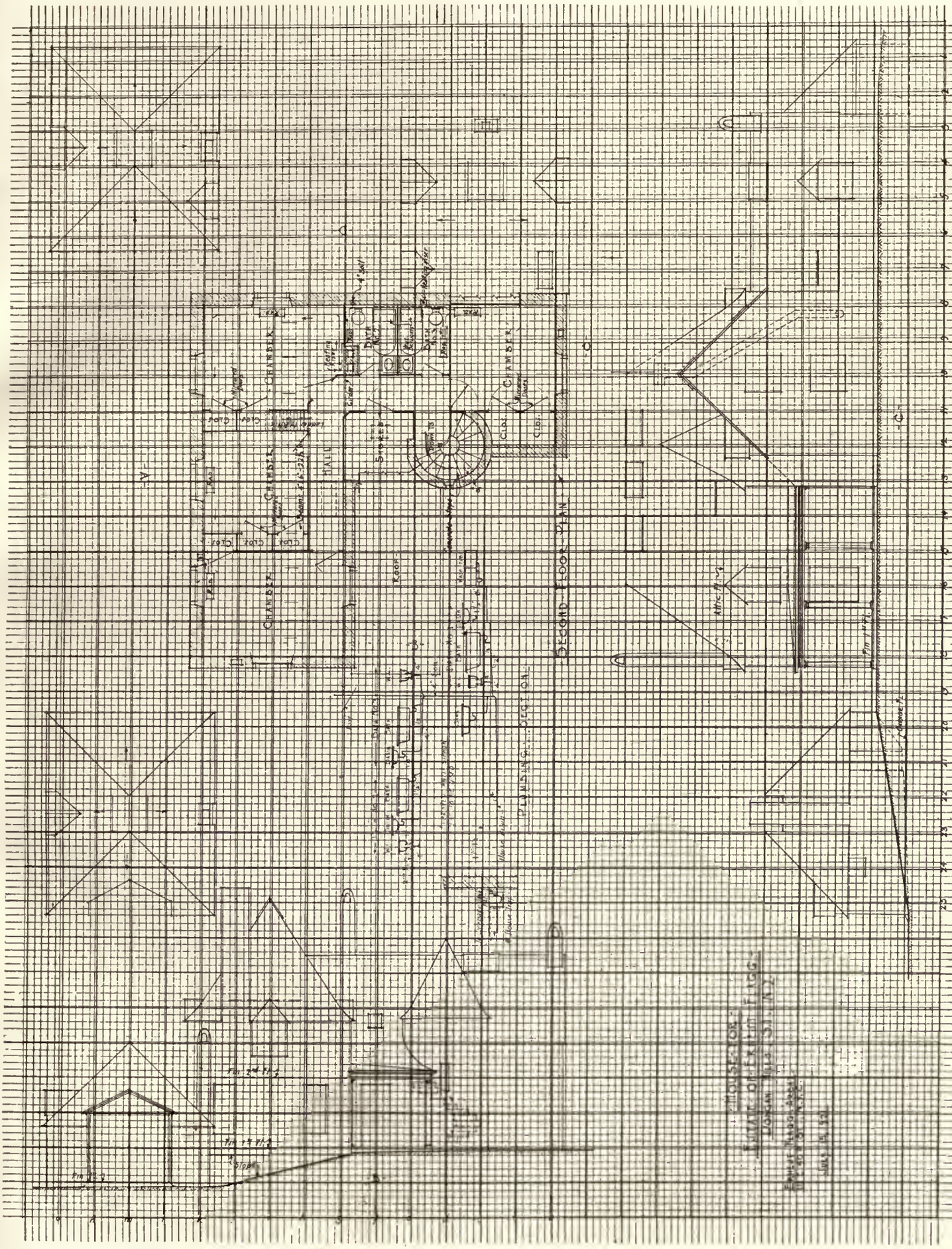


ARCHITECTURAL DESIGN BY THE USE OF A MODULE.
Ernest Flagg, Architect.



ARCHITECTURAL DESIGN BY THE USE OF A MODULE.

Ernest Flagg, Architect.

(*Continued from page* 315.)

by some fixed unit of measure of sufficient size to serve as a workable module, irregularities must creep in, and every such irregularity calls for special treatment; thus a great part of the value of standardization is lost. For instance, if a place is found where the standardized door or window will not fit, one must be designed and made which will fit, and to do that is generally, in each instance, as much trouble as to design and make the standard part itself. But where the fixed unit reigns throughout, all standardized parts will fit; no surprises occur, all axes are preserved, and every feature falls naturally into its proper relationship with all other features.

In nothing is this better illustrated than in the use of exposed beam ceilings. With common methods of planning, the use of such ceilings is so troublesome that they increase cost and they are, therefore, seldom found except in expensive buildings, whereas with the use of the module all that is troublesome about them disappears like magic. The spacing does not have to be thought of. The module or some subdivision of it determines that, everywhere, and exposed beam ceilings, instead of involving extra expense, result in great economy; as by their use much of the cost of plastering is saved and additional space brought into use.

Every one knows that in order to produce the best results in architecture, long and careful study of the design is necessary. The more important the building, the longer the required study. As architecture is now practised, it is only in monumental constructions that one expects to find the sort of planning which follows almost as a natural consequence from the use of the module. The preservation of axes, symmetry of arrangement, the proper and harmonious relationship of all parts to each other and to the whole, correct proportions, and the absence of all makeshifts in design, which are the marks of careful study, may be had almost without effort with the fixed measure.

Of course this does not mean that any good design can be made without careful study, but the presence of commensurability removes so many difficulties from the path of the designer that the process is made comparatively easy, and the design of a simple dwelling made in this way has about it that finish, harmony, and precision which one would hardly expect to find, under other conditions, except in the most carefully studied monumental construction. In advocating the use of the module in architectural design, the writer wishes to disclaim any intention of holding it up either as a sure receipt for good design or as a certain means of escape from bad design, but rather as a valuable tool which can be made use of by the designer in proportion to his abilities.

One of the chief benefits of the proper use of the module is that it so simplifies and lightens the work of the architect as to place it more directly under his personal control. By its aid he can, with his own hands, in a few hours, do work which without it would require weeks of a draftsman's time, and while greatly reducing his costs, it should lead him to much better results. As an illustration of the truth of this statement there is herewith reproduced the working drawings for a small house. After having designed the building, free hand, to a small scale on paper ruled with the module lines only, the writer made these working drawings (on sheets ruled with the module lines and parts, as may be seen) in exactly three hours. This included everything except the plumbing section and the strengthening of the lines in lead-pencil, which was done by a draftsman. As will be observed, few figures are necessary, and the making of the whole drawing probably required less time than would be needed for the figuring alone under ordinary methods.

It will be seen that the inside of all exterior walls runs on the module line. To face a wall, or pier on a line, is much easier, simpler, and more convenient than to centre it on a line. It is the most primitive and natural way of laying out work and evidently the method used by the Greeks, as any one may see for himself by drawing, on the plan of any Greek Doric temple, lines through the centres of the triglyphs in both directions. There it will be seen that the faces of the walls follow the module lines, and that the centres of the columns do not coincide with the intersection of module lines, showing that the columns were placed at least in one direction by lines tangent to the drums.

In general, great convenience results from placing the inside of walls on the module lines, for it insures symmetry in the rooms, though this would not always be true if partitions of the usual thickness were used. In houses designed by the writer the partitions are only 1¾″ thick, made by hanging a jute net and plastering both sides of it. The partitions are generally centred on the module lines, and as the distance from the centre of the partition to its face is ⅞″, the rooms would be out of true by that much were it not for the plaster on the outer walls which reduces the discrepancy to ⅜″, which is so slight as to be negligible. The accompanying figure, drawn to an exaggerated scale, will serve to illustrate this condition. Here the letters *m* indicate the module lines. The partitions *P* are centred on the module. The inside face of the walls are also on those lines, but the plaster on the walls is inside the lines.

A description of the method which the writer has found most convenient for laying out work on the ground may prove of interest to some. The chief module lines are first defined by driving stakes in the ground at the end of each such line and about 3′ beyond the inner face of the proposed wall. Cross-pieces are nailed between each pair of uprights at a uniform level, above the proposed finished ground floor. On each cross-piece a nail is driven exactly on the module line, so that a string drawn from one nail to its opposite will exactly coincide with the module line. When this is done, trenches for the foundations are dug outside the proper lines. The foundation walls are then built and finished off true, smooth, and level all the way around to the height of the damp-proofing, which is 2″ below the finished floor. When that is done the module lines, as indicated by the strings, are marked on the work, after which all other modules are easily, quickly, and exactly marked on it by the use of module scales or poles. By this method the utmost accuracy is obtained, and the work proceeds with an exactitude quite unusual in ordinary construction of this class.

It has been found that nothing is more conducive to speed in building by this method than great accuracy in laying out the work. If started right, in this way the building proceeds in a most delightful fashion. Everything fits exactly and the various parts go into place like pieces in a house of blocks. The accompanying photograph shows the layout on the ground of the main module lines of the house, the plans for which are here given. In this case the cords are set at 18″ above the finished ground-floor level of the main part of the house. Lines for the storage building and garage were not in place when the photograph was taken.

The Problems of the Young Draftsman

By David B. Emerson

THE young man fresh from college or a technical school on entering an architect's office will begin to find himself confronted with many problems both new and difficult. To be sure, he has probably worked in offices during his vacations, but such work was not taken seriously, nor was he taken seriously, for who ever took a vacation worker seriously? Now, it has become a decidedly different matter; actual work has really begun, and the question is one of either success or failure.

One of the very first things the beginner in an office will rapidly learn is the great difference between the "projet" and the "job," the ideal and the actual, between school drawings and working drawings. The great majority of the young men who graduate from the bulk of the architectural schools are very well grounded in a knowledge of the orders, but they are wofully lacking in a knowledge of architectural styles. Given a fairly simple design to make in any one of the many different styles that are in current use, he flounders hopelessly because of a lack of fundamental knowledge of the style.

All really good offices have good libraries, and a young man starting in an office should become acquainted with the library, and learn to use it intelligently. Unless a young man is exceptionally talented and shows great aptitude in design, he will very likely be called upon to make working drawings and details, rather than to design and make sketches; also, he will have to work with one or two other draftsmen getting out the drawings for a building, and then he will begin to learn the value of team-work and close co-operation. The writer very well remembers one talented young draftsman who was put to work helping him on a building where the grade levels had been very carefully worked out, and without consulting any one he added one step to the front entrance, "because it looked better." Such things are occurring constantly, because of the lack of team-work and co-operation. In school a man generally works alone; in an office he must almost always become a part of a working team.

In making working drawings, especially in residential work, it is very necessary to make proper provision for plumbing fixtures and other utilities, and very often the young draftsman runs amuck with these necessary details, showing kitchen sinks either twice their size or half their size; bath-tubs are sometimes drawn six feet long when a five-foot tub is all that is needed or wanted. The construction of chimneys and fireplaces should also be carefully studied, as a great amount of trouble and worry is occasioned on the work by the improper drawing of these items, and oftentimes in order to construct them at all changes have to be made which mar the design of what would otherwise have been a charming room. The failure to allow sufficient head room in stairs is the "bête noire" of most young draftsmen. The majority of them forget to allow for the thickness of the floor and for the thickness of the stair-run above, both of which have to be considered. Also, there is a tendency to figure too closely, and as a result the header will be too close to the nearest riser, and a tall person will bump his head going down the stairs. The under side of the header should always be at least seven feet above the tread below.

One of the most troublesome problems a draftsman will encounter in his work is that of allowing sufficient room for boiler and fuel rooms in the larger class of buildings. Very few, if any, of the younger draftsmen, as well as some of the older ones, appreciate the amount of room required for these utilities, consequently in many otherwise well-planned buildings, when it comes to installing the boiler or boilers, as the case may be, it will be found that they are badly cramped for room. To add to the trouble, the fuel-room will be found to be entirely too small and only half enough coal can be stored at a time.

The best plan is, when the building has been tentatively planned and it is possible to approximate the radiation, to have a heating contractor to roughly figure it out; then get the size boiler required, allowing a little leeway for any possible miscalculation. Then lay out the boiler to scale from the diagrams in the catalogue of the boiler manufacturers, being careful to allow a fair amount of room on all sides for working space. If a cast-iron boiler is to be used, allow sufficient room in front of it for firing; not less than five feet. If a steel boiler is to be used, allow enough room in front of it for drawing tubes, that is, at least the length of the tubes in front of the boiler.

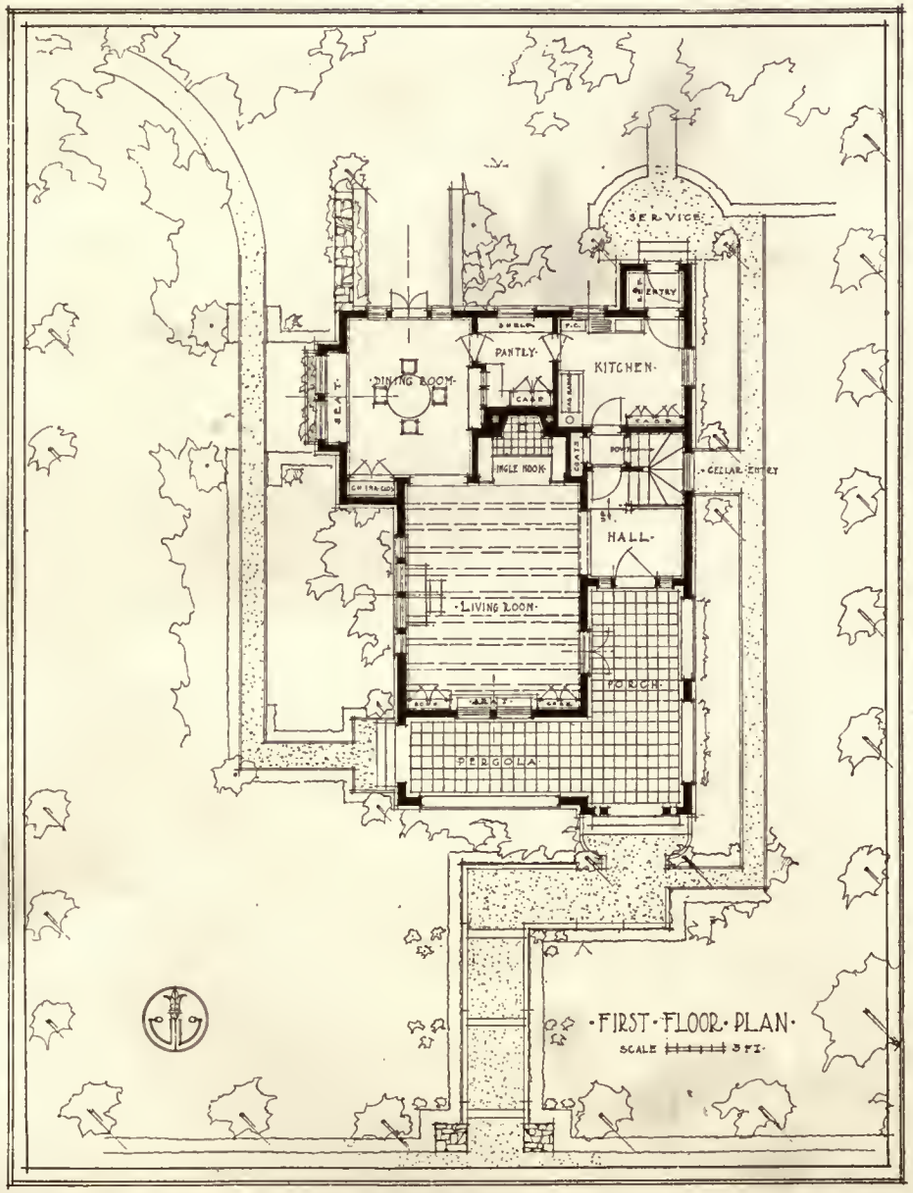
Quite as important as the floor space in the boiler-room is the question of the head room; therefore, find out from the heating contractor how much head room is needed and then allow a little more for possible contingencies. Make careful inquiries and find out how large a supply of coal the owner wishes to carry. Some owners like to put in a season's coal at a time; others are satisfied to carry only a month's supply. With this information figure out the capacity of the fuel-room, allowing about forty-five cubic feet to the ton of coal. All of this may take a little time, but it will be time very well spent and may save lots of time and worry later on.

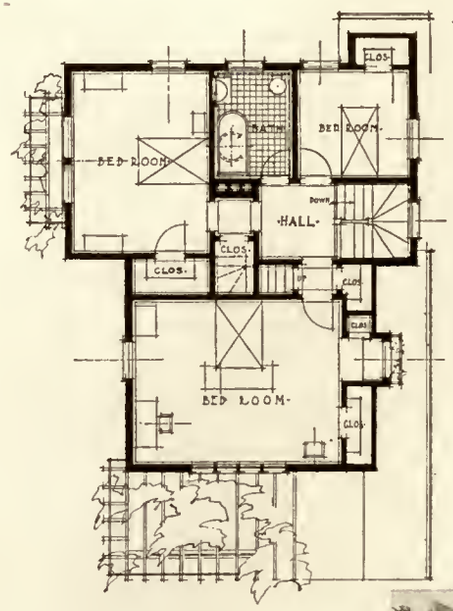
These are only a few of the many problems that come up in the workaday life of a draftsman, but most of us have fallen down on some or all of them. It may be well to repeat here for the benefit of the young draftsman what the late James Renwick, then an old man, said to the writer years ago: "Young man, always remember this, the foundation of all good architecture is common sense."

Announcements

John N. Tilton, Jr., of Marshall and Fox, architects, announces that he is continuing the practice of architecture established in 1882 by his father, the late John N. Tilton. His offices are at 123 South Kensington Avenue, La Grange, and 721 North Michigan Avenue, Chicago.

Mr. Harold P. Bergen announces the opening of an office at 607 Worcester Building, Portland, Oregon, for the practice of architecture. Mr. Bergen is a graduate of Columbia University, of New York City, and has lately been associated with Mr. Thomas W. Lamb as manager of his Canadian office.





PLANS, HOUSE, C. C. WENDEHACK, MONTCLAIR, N. J.

C. C. Wendehack, Architect.

HOUSE, C. C. WENDEHACK, MONTCLAIR, N. J.

C. C. Wendehack, Architect.

The Timber Supply

WITH the addition of the present growth of new timber, at the annual rate of approximately 20,000,000,000 feet, there is now standing in the United States enough timber to secure a supply of raw material for the lumber industry for over one hundred and fifty years, according to the secretary-manager of the National Lumber Manufacturers Association. He adds that the excess of exports over imports may somewhat increase the annual drain upon our forests, but thinks it exceedingly doubtful whether the total domestic consumption will much, if any, exceed to-day's figure, which is less than 33,000,000,000 feet a year.

Because lumber production is below normal and stocks are low, many persons make the mistake of supposing that the timber resources of the country are fast failing, and that they must look about for some substitute material for wood.

With the diminishing of the timber supply is the not less important fact that not so large a supply as formerly will probably be needed in the future, as standards of wood utilization and methods of living change, and demands vary in different generations.

Before worrying over a timber famine and demanding that more trees should be planted, public and private interests should both look to the conserving of the timber resources they now possess. There should be more adequate public protection from fire and insects, and private care in preventing animals from uprooting seedlings, and in not injuring trees by turpentining and similar processes.

Many years ago in the Senate there was predicted an early timber famine, and among other scare-inspiring things it was said that the white pine of the Northern forests would not last more than ten years. There is still some white pine left, and there is now more timber standing than these senators believed existed in the whole country at that time.

Preventive measures are urgent, as is evidenced by the recent terrible fires in the great Northwest forests, but these measures with natural replacement will accomplish much to keep up an adequate timber supply for future generations.

The reason for present higher prices of lumber is the high rate of transportation added to decreased production and scarcity and incomplete assortment of stocks, and this is caused largely by wages and other higher costs of production. In 1918 lumber production was only 72.7 per cent of what it was in 1913, and it will probably not be very much more than this in 1921. Increased production should follow a settlement of labor difficulties, especially if the industry does not then have to bear a big increase in transportation costs.

Adaptability of Wood

WOOD is so adaptable to every construction use that a great many persons think all it needs is the carpenter, says a prominent lumber authority, but it must be remembered that some wood is more adaptable than another to a certain purpose; also that while it may be that in other forms of art "the more difficult the medium, the greater the art," in architecture the more adaptable the medium, the greater the possibilities of true art in its use, and true art must include a certain amount of restraint.

Wood is not only adaptable to art and to permanency but it is adaptable to change, not simply the change here and there of a detail during construction but the change that is inevitable to all construction in the course of time, as the adding of a new wing or a sleeping-porch to the home, the converting of a stable into a garage and minor changes which are necessary to install newer methods of ventilation. There is always a little changing and in the course of a generation or two this changing is an important feature to be considered. It is in this respect that the adaptableness of wood may be emphasized.

The builder must use wood intelligently and look to the proper construction of chimneys and other vent shafts, as nearly half of all fires may be traced to faulty construction in chimneys or fireplaces.

Insignificant Fire Hazard from Shingle Roofs

THAT fire loss because of sparks on roofs is extremely insignificant as compared to losses from other causes is strikingly shown in the recently compiled schedule of losses paid in 1918 by The Lumber Fire Mutual Insurance Company.

The main causes are arranged below in the order of losses in dollars paid in 1918, and they not only indicate where preventive measures are most necessary, but they furnish another argument in favor of not eliminating the use of shingle roofs. This comparison is valuable to lumbermen as it helps substantiate the fact that wooden shingle roofs, about which so much has recently been said, are not the fire hazard which they are claimed to be by some agitators.

1. Sparks arising from combustion, as from chimney, defective boilers, railroad locomotives, $49,025.10. 2. Incendiary, $32,356.27. 3. Conflagrations from buildings and forest fires, $29,252.67. 4. Exposures, $21,878.40. 5. Smoking, $14,680.77. 6. Electricity, $12,321.29. 7. Friction from running machinery, $10,342.31. 8. Stoves, furnaces, etc., $915.96. 9. Chimneys, flues, etc., $870.38. 10. *Sparks on roofs*, $46.62.

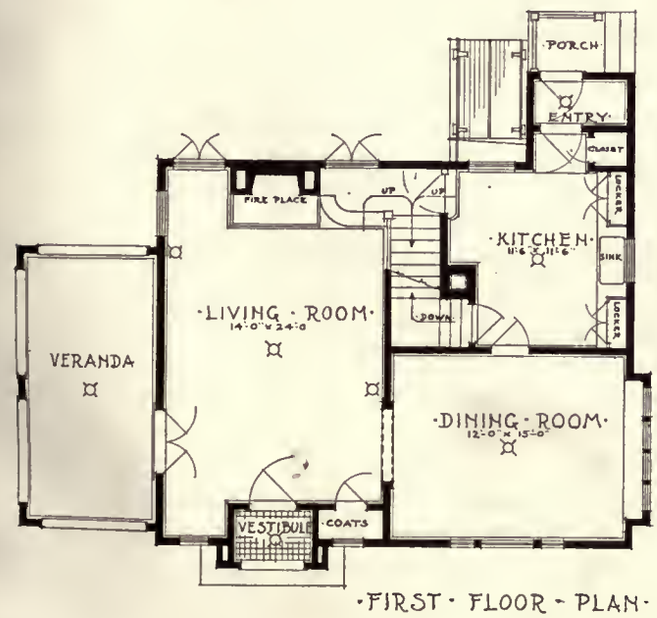
Forest-Fire Losses

TWO-THIRDS of Canada's forests have been destroyed by fire in the last seventy-five years, according to figures of the forestry department of Canada. The amount of timber burned would have supplied the world for four hundred and fifty years, at the present rate of consumption, and represents a loss of a billion dollars.

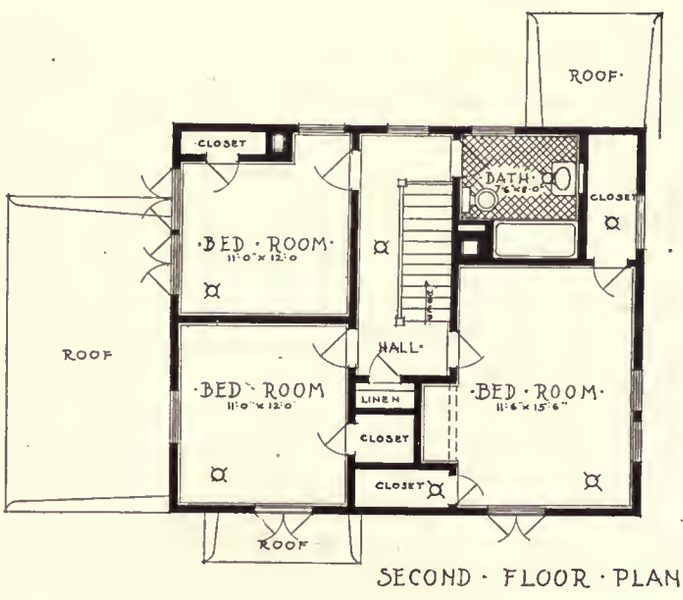
Canada still has 1,900,000 square miles of forests, the forests of British Columbia constituting one of the two greatest tracts of commercial timber in the world, the other being in Russia.

Forest-fires in this country are designated by Colonel W. B. Greeley, forester, as "the chief cause of forest devastation," and he urges most emphatically the immediate need of a nation-wide drive against the forest-fire.

Not only have great forest-fires visited this country since the landing of Columbus, but large tracts were swept clean of timber before a white man ever used an axe here. An eminent scientist and historian, according to the *American Lumberman*, states that if the discovery of America had been postponed five centuries, the discoverers would have landed on a treeless continent. Indians and lightning set these fires. The Indians were burning the woods to make pasture for deer and buffalo. Most of the forests had been destroyed in the region between the Rocky Mountains and the Mississippi River before the advent of the white man.



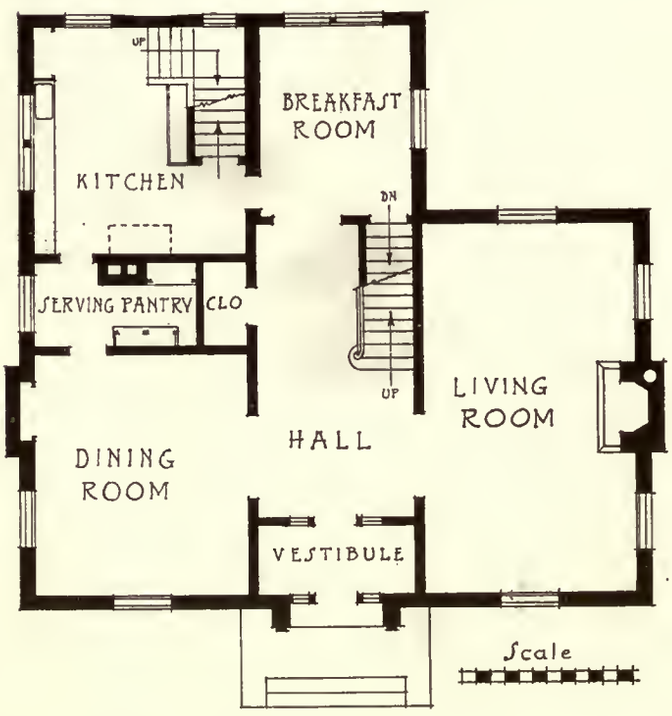
FIRST · FLOOR · PLAN



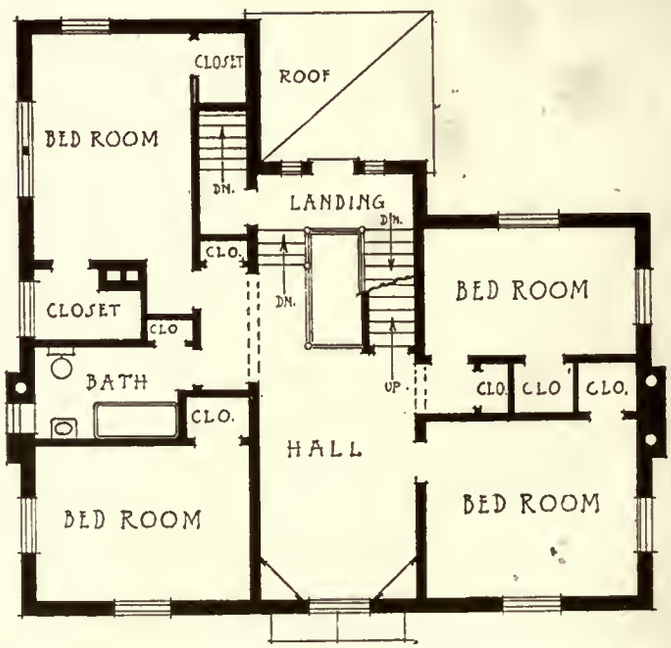
SECOND · FLOOR · PLAN

HOUSE AND PLANS, GEO. C. ROSS, NEW HAVEN, CONN.

Shiner & Appel, Architects.



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE, F. S. MILLER, ROCKWELL CITY, IOWA.

Damon & O'Meara, Architects.

ARCHITECTVRE

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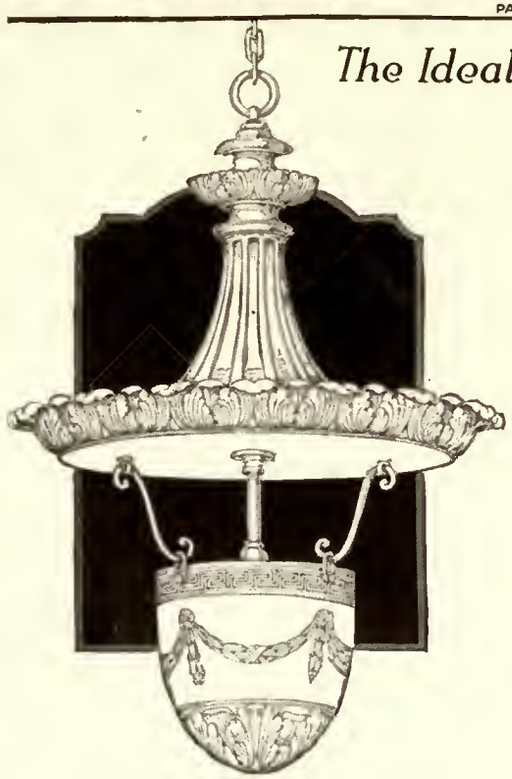

Specially designed fixture of Compo construction with old ivory tinted reflector base and ceiling band finished in antique gold. Bowl of calcite glass

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Brascolites were selected for the Illinois Bell Telephone Company's general offices after a careful consideration of the problem and various tests extending over a period of more than a year. Competent architects and engineers of the telephone company, as well as engineers outside their organization, were consulted, and all factors which should enter into the selection of lighting equipment were carefully considered in the light of experience gained from long-time operation of sample fixtures.

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TYPICAL PARISH CHURCH OF THE MARNE AND MEUSE, FRANCE.

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Church-Towers of the Meuse

By Ralph Fanning, M. S. B. Arch.

Illustrations by the Author

"That spire is gone that slept for centuries,
Mirrored among the lilies, calm and low;
And now the water holds but empty skies
Through which the rivers of the thunder flow."
—Herbert Asquith in "The Volunteer and Other Poems."

THUS wrote an English soldier from the battered fields of France, voicing in his verse the sentiments that must be those of many others who, lacking the gifts of poetic expression, yet contemplate with emotion the wreckage of the parish churches whose towers and spires and belfries made much of the charm of the landscape of northern France. Gone in many places are the picturesque landmarks; mutilated beyond the powers of the restorer are many of the quaint architectural motives; desecrated by the grim hands of war are the towers of many sacred shrines; yet those that still remain, battered and forlorn as they may be, are worthy of veneration and study, not only as sacred relics symbolic of a stanch faith, but as architectural features of artistic value in line and proportion.

Spire of Lavoir, Meuse.

The churches of the Department of the Meuse, in the little villages frequently scattered over the rolling hills, nestled in the sheltering Argonne or mirrored in the placid waters of the Meuse or Aire, perhaps suffered as sad a fate as any group of structures could, and by their loss took from the world much of modest architectural grace and beauty. Although the Meuse in its balmiest pre-war days could boast of no famous religious edifices of artistic grandeur such as Rheims, Amiens, or Soissons, its larger churches, such as the cathedral at Verdun, and the interesting old churches of St. Pierre and St. Antoine at Bar-le-Duc, would have demanded special notice had they not been in a land of great religious monuments. But even the small parish churches, in spite of their insignificance by comparison with the more pretentious and famed, bore not only dates and historic records that would fascinate the curious student, but features of real artistic merit to attract the artist and architect and every lover of the beautiful and symbolic in religious and social expression of human achievement.

Travelling northward from Bar-le-Duc, the prefecture of the Meuse, which is in the southernmost corner of the department, one may leave behind the clock-tower, "à la côte Ste. Catherine," the seat of the ancient dukes of Bar, may bid farewell to the churches of St. Antoine and Notre Dame, thinking to say adieu to all traces of architectural interest in the rural regions beyond the Ornain—where the ravages of war have been so evident during the late years—only to find before many kilometres have been traversed repeated reminders of religious zeal and architectural skill in quaint and unexpected towers. Whether one travels

Curious parish church of the Ardennes.

The tower at Dombasle, Meuse.

along the dusty white roads or on the dubious narrow-gauge railroad, the surprises are the same. Appearing around some bend in the road, raising up from behind some sunny verdant grove, silhouetted against a distant low-hanging mass of cloud, peering over a cosey nest of dull-red tiled roofs, one church-spire after another beckons the traveller on his course. Like exclamation-points in architecture, as it were, they add the interest to the landscape that keeps the traveller's eye alert.

There are churches of aspiring dignity like Revigny, Laheycourt, Triacourt, Walley, Rarecourt, and Auzeville. The aspiring sumptuousness and formality of these seems all out of keeping with the poverty and humility of the villages nestled in their protecting shadows, until one notes the age of the church and realizes that while ofttimes a village may have burned or fallen in decay, the church of heavy stone construction still stood to witness the growth or decline of succeeding village life. There are smaller though hardly less interesting churches such as Brizeaux, Frodois, Lavoir, Brabant, Le Neufour. There are unusual churches, unexpected in plan and position, like Beaulieu, Passavant, Clermont, Dombasle, Lachlade. Then there are the ghosts of churches, sad ruins now, only crumbling stone and tile and mortar to mark the place where once stood some dignified or interesting or original house of worship. The pathos of the fate of these dead churches, such as Varennes, Montfaucon, Clermont-en-Argonne, Neuilly—to mention a few from many—increases as one realizes the meagreness of the records that remain to perpetuate the memory of these shrines of beauty and devotion. Only some charred and tottering walls, a faltering arch, a fallen buttress, a bit of broken saintly image or crumbling gargoyle can serve in so many cases to recall to the eyes of the former worshipper the religious home of happier times. In but few cases have photographs or illustrations remained to picture the former church with all that it must have meant to the provincial French peasant in its connection with baptisms, conversions, marriages, and deaths.

Of those churches that still remain, many interesting architectural features instil within one a hope that many of the fallen monuments may still be preserved from further decay or restored in their original lines. Most prominent of the features and those most sadly missed in the landscape are the towers and spires that dominated the countryside before the devastation. Of the remaining ones, the massive stone bases seem to encourage the nave or church proper, as well as ofttimes the neighboring structures, to lean upon it for support. There may be an opening in the base, heavily voussoired as befits the solid masonry, or projecting quoins of rococo-like decorations. Painted images of patron saints may find shelter in small niches within the thick walls. There is usually, however, little to break the dignified solidity and strength of the square church-tower until it rises above the roof of the church. Here it portrays its function of being the home of the bells.

The ringing of bells, proclaiming the passing hours or calling to rest or prayer, was an intimate part of the very atmosphere of northern France. Shuttered openings of varying shapes and sizes appear in the upper tower to emit the metallic tones over the moss-grown roofs and patchwork fields and dark woodland, until their vibrations would

The clock-tower, Bar-le-Duc.

Church at Frodois, Meuse.

meet and mingle with those from a neighboring spire. A curious clock, the ingenious device of some clever mechanic, would show a face or more to warn the tarrying villager of fleeting time, or call forth his Gallic contempt and witticisms if the wooden hands failed to move with timely discretion.

Sometimes a stone spire rose above the square base of the tower, rising aloft on its pyramidal or conical apex, the cross with the weather-vane cock of France above, again the proud handiwork of some honored village craftsman. There comes to mind the words of a battered old French carpenter who, after the passing of armies through his weary little village of Brizeaux, would forget his own aches and pains and hunger to gaze at the shattered point of the church-spire and bemoan the fallen fate of the former surmounting cross—"a cross magnificent, higher in stature than twice six foot, monsieur"—which he, himself, had erected with his own hands.

Other spires might be of lighter though more curious workmanship; elongated hexagonal or octagonal pyramids made of wooden frames covered with sheet metal or slate joined to the masonry base by a curious transition of bulbous cushion-like forms, curved planes and warped surfaces, making siolettes unique yet pleasing. The vogue for these unusual forms that must have called forth exceptional skill in craftsmanship, even when formed of pliable metal on wooden forms, seems to have been prevalent throughout the Meuse. Their origin and the source of inspiration for their designers would be as interesting to fathom as they themselves are to encounter. One is reminded of Moorish and Near Eastern domes and turrets. Could it have been that the Spanish invasion of the Netherlands brought with it the architectural influence of the Moors to spread its forms in the remote valley of the Meuse, even as this foreign influence is seen in some of the mediæval works in Belgium? This seems a bit far-fetched, yet Spanish-worked iron fire-backs of authentic date have been found in this region. More probable is the inference that this style of irregular spire construction was introduced into some village by a travelled priest or craftsman, who thus set the fad for competing villages to imitate or rival.

Whatever may have been the source of the architectural form, the fact remains that these village churches played a lofty part in modelling the lives of the people who dwelt within the shadows of their spires and the sounds of their bells, and later gave full proof of their willingness to make the supreme sacrifice for the salvation of their altars and hearthstones. As the wounds of war heal, may the angelus again be heard throughout these stricken regions, but with a deeper tone of thanksgiving for those churches that do remain, even battered as they are, and with a ring of hope that a lasting peace may come to perpetuate the placid reflection of the sanctified towers in the waters of the Meuse.

The church-tower, Rarecourt, Meuse.

A Pilgrimage to Plymouth

By Dwight James Baum, B. of Ar. A. I. A.

(Continued from September issue)

PART II

Doorway of Miss Alice B. Barnes's house, Plymouth. Built by Benjamin Bartlett, 1726.

PLYMOUTH does not express as much as Andover, Salem, Marblehead, and a few other New England towns, the growth and prosperity of the town and its people. The early settlers have left examples of architecture showing their humble farmhouses of the seventeenth century and the more dignified yet simple houses of the early eighteenth century. Then there seems to be a lapse of building until a later date, from about 1803 to 1809, and even then only a few good examples seem to have been built.

Generally all colonial towns in New England repeat in a large degree the salient characteristics of every other colonial town. Also, generally, if fine detail is found on features of real early houses, this was added at a later period.

Whether good sense of proportion throughout was instinctive, or accidental, the result was none the less interesting and worthy of careful study. This early colonial architecture was not monumental but showed a certain characteristic grouping and ornamental treatment that was distinctive.

It struck just the right note of proportion, harmony, and fitness, and showed also the distinctive character of the lives of the people. Even by glancing at the exterior of their houses and looking at the material and how they used it shows that here exists an indigenous architecture wholly suited to its purposes.

House, George Hobart. Built 1719.

One of the interesting peculiarities of early American domestic architecture is its localism, adherence to type in a restricted locality.

(*Continued on page 330*)

Miss Alice B. Barnes's house, Plymouth. Built by Benjamin Bartlett, 1726. Once owned by the Howland and Carver families.

Interior, house, George Hobart (1719).

ISAAC WINSLOW HOUSE.

DOORWAY.

THE OLD KITCHEN.

FIREPLACE AND SECRET CLOSET.

A particular local type of vestibule is shown on the Isaac Winslow house, built at Marshfield in the year 1699. Here also is one of the few examples in the district of the Georgian stone-quoin treatment adapted and carried out in wood.

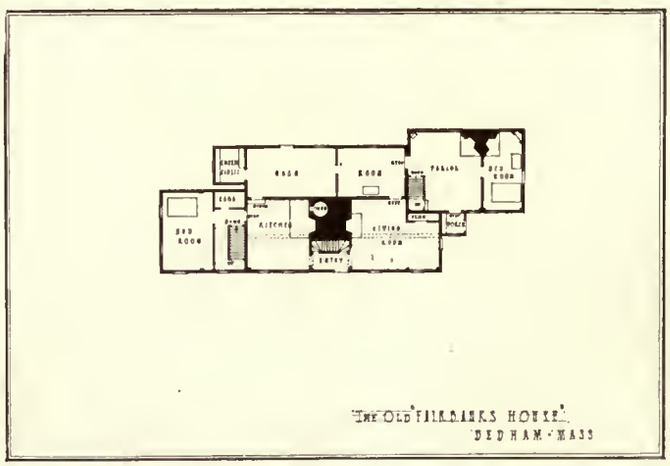
At this early date the germ of panelled walls on one side of a room, especially around the fireplace, found root. In the Winslow house this is shown both in the kitchen, where there exists a charming wide fireplace with a panelled-door treatment on one side, and a balanced-cupboard treatment with panel over fireplace in a bedroom above. Later such a treatment was carried across the entire side of the room, making a quaint and finely American colonial treatment.

Mr. Low's house on North Street (overlooking the bay).

Edward Winslow house, North Street, Plymouth, built 1754 (after alterations).

(*Continued from page* 328)

As in classical architecture which originated as a one-storied style, the smaller and simpler two-storied houses of modest type are quite often the most attractive. They are severe as were their builders' lives, crude in a way yet pure in line, well balanced and well proportioned. They were simple yet dignified, built well by honest craftsmanship. Even to-day they are correct architecturally, and, if altered, would probably lose their quaint charm. We of to-day are awake to the possibilities of adapting these old houses and with them as a prototype are again trying to develop a typical American architecture. The later period of colonial work began in the earlier part of the eighteenth century when men had more time to think of the finer things in life, the country had been subdued, and other functions besides safety and utility could be considered. Then early in the nineteenth century architecture sunk to ignoble depths and it has taken nearly a century to bring back some of the quaintness and charm of those early periods. During the eighteenth century the English Georgian period was drawn upon, but adapted rather than reproduced. Effort was made to ornament the exteriors and with it a grace and charm was given that was lacking in the earlier work. The style was no longer simple and expressed living under happier and less stern conditions than under Puritan conditions.



Typical simple original plan of New England house with added wings, etc.

Then step by step the development of these houses expresses an era of prosperity, culture, and refinement. The fourth dimension was mastered even in the farmhouses of early New England. Construction did not require a lot of money but apparently did take some expenditure of thought. The question of proportion is intangible, and often the least ornamented houses give an impression of the greatest distinction. The regrettable love of change by the American people as well as the growth of cities has served to destroy most of these examples, but in smaller communities such as Hingham, Duxbury, Marshfield, etc., they still can be found.

Later, Plymouth, etc., suffered from the Greek revival, with a particularly heavy hand. The central-chimney plan remained in fashion up to the Greek revival, although the houses grew larger, lost their quaintness, and acquired more

(*Continued on page* 332)

North and Court Streets, Plymouth (1921), showing buildings of different periods.

House on Pleasant Street.

EDWARD WINSLOW HOUSE, NORTH STREET, PLYMOUTH, 1754 (BEFORE ALTERATIONS).

DOORWAY, EDWARD WINSLOW HOUSE, 1754 (AFTER ALTERATIONS).

DOORWAY, EDWARD WINSLOW HOUSE, 1754 (AFTER ALTERATIONS).

The Edward Winslow house at Plymouth, built in 1754 by the son of Governor Winslow, is another example of refinement that was beginning to show at this time. Here is expressed the best work of the district and time. The detail of the original entrances is beautifully carried out and expresses, as does the entire original house, much care and thought in its design. A few years ago this house was purchased and remodelled, and, somewhat like the well-known story of a famous doctor, "the patient died of improvements." Parts of the house still are visible through the large porch that was added, the original simple roof can still be seen through the various new balustrades, and an ornate pedimented entrance on the side shows the extremes sometimes tried when alterations are considered, which results in overornamentation in certain features, taking away from the original design. The approach has also been spoiled, for how much more successful are the surroundings of the Barnes house with its simple wall and unpretentious picket fence.

Doctor Hill's house on Court Street. Built by John Bartlett and Seth Morton, 1803.

(*Continued from page* 330.)

dignity. Then the plan went out of fashion and the central-entry type of plan became popular. The framing was sometimes of oak, otherwise hard pine, the exterior casing usually of white pine, so quite often left to the coloring agencies of the weather.

Nearly all Massachusetts houses of the period before and around 1700 have central stacks with rooms and entry grouped around same. The roof lines express an atmosphere of New England primness.

Another characteristic is the adding on to the rear, in endless sequence, laundry, dairy, coal-bin and woodshed, smoke-house, etc., until on some farmhouses the dependencies joined on with the barn.

The gambrel roofs sometimes show that short upper slope which seems to give a quaint aspect to the entire roof.

The Barnes house in Plymouth, which was built in 1726 by Benjamin Bartlett and later owned by the well-known Howland and Carver families, shows one of the earliest pitched roofs as against the gambrel and gabled ones universal throughout the district. This house with its simple, low roof, in well-proportioned mass and interesting fenestration, is a fine example of early refinement. Here again the Winslow type of vestibule is used, breaking up the otherwise severe front. Instead of plain door, as in the first example, simple side-lights balance the door, the corners being finished with flat pilasters and a simple cornice above. The roof is kept flat, which is also a departure from previous work. Here the simple walls of large stones and the small picket fence above add quaintness to this old place.

In the Doctor Hill house, built 1803 by John Bartlett and Seth Morton, which is located on Court Street, the main street of Plymouth, is an example of a small town house on a narrow lot which is interesting in both scale and detail. The main entrance and the side entrance are both unusually placed. The detail of the pilasters, caps, and cornice mouldings are exceptional in their delicacy for the district, and seem to have a flavor of South Carolina instead of New England.

In the Paty doorway on Sandwich Street a method of getting light into the hall was worked out by giving a greater width above the door trim to the architrave than from trim to pilasters. Then glass was inserted flush with the wood surface. This had the advantage of keeping down the height of the exterior treatment.

Doorway of Doctor Hill's house, Plymouth. Built by John Bartlett and Seth Morton, 1803.

Doorway, Joseph Barnes's house, Plymouth.

Doorway.

The doorway of the Joseph Barnes house also has the Southern feeling in its scale and cornice detail. Here the plain architrave and pilasters prove unusually interesting beside the very narrow siding and simple shutters.

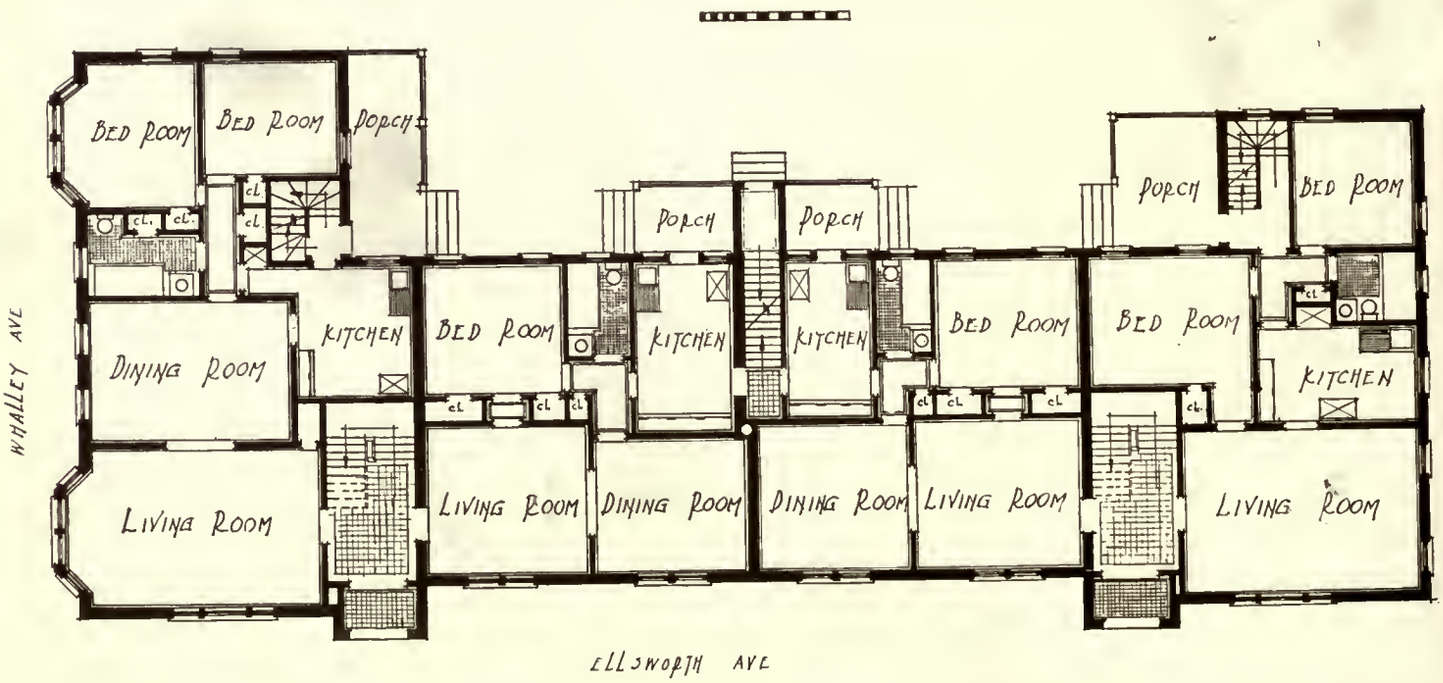
Some years ago the Antiquarian Society purchased the Lathrop house, which was built in 1808. This house is not characteristic of any type but instead it has violated all precedent in every one of its features. Instead of the usual straight front, part of this elevation is sloped, forming a bay on an angle.

Staircase, Paty house, Plymouth (demolished).

There is a porch along its entire frontage, which is in turn cut in two by a vestibule and small room combined that comes to the porch edge. This means that one must step out of cover to reach the porch. The scale of the window-openings are large in the front, but on the sides and rear are reduced, giving three stories in place of the two in front.

For the student of colonial architecture Plymouth offers many different types worth studying, a field little explored and an atmosphere of quaintness not often found. The surprising thing to the visiting architect is the lack of any adequate published information either in text or illustrations.

Lathrop house, Court Street, Plymouth, 1808. Now the home of the Antiquarian Society of Plymouth.



ELLSWORTH APARTMENTS, NEW HAVEN, CONN. Jacob Weinstein, Architect.

Editorial and Other Comment

Some Significant Facts

THERE has been and continues to be a more or less vague and unsatisfactory discussion of the labor cost in building construction. We all know that wages are abnormally high, just as we all know that the cost of materials and the cost of living are high. The high cost of materials is dependent upon the first. Just how far dependent is made apparent by some valuable figures recently published by Col. Sanford E. Thompson, a member of the Hoover Committee on the Elimination of Waste. According to this authority:

"In the last analysis the great bulk of the 100 per cent which represents a completed building is made up largely of labor, with small increments for the value of the raw material in its original state and the use of funds for carrying on the development of this material. From figures at hand we estimate the direct labor entering into the construction of the building, together with labor in manufacture of materials and equipment and transportation to be at least 78 per cent. Carrying this a step farther to include the indirect labor, which is made of clerical work and general supervision from the home office, salesmen's salaries, etc., would add another 10 per cent, making the total direct and indirect labor some 88 per cent of the total cost of the building."

These facts, while they have undoubtedly made many investors hesitate, have in a measure made it evident to many that waiting is likely to be as much of a losing game as any possible present risk. No matter what the immediate future may hold in possible readjustments they will not be sufficient to deny for a long time a profitable return on present building.

It will take years, not a year or two, for building to equal the demand, especially in our cities where the congestion of population seems, in spite of living conditions, ever on the increase.

We note a tremendous increase in speculative suburban building in the vicinity of New York and there are indications of the same eagerness to profit by suburban demand all over the country. There seems to be a great need of two-family houses and we have been asked a number of times for issues in which plans for this type have appeared, and also for small suburban apartments for private ownership.

For a Uniform Building Code

IF the secretary of commerce succeeds in establishing a nation-wide standardization of building codes, plumbing codes, etc., he will have gone far toward putting an end to one of the sources of waste and haphazard methods. Standardization of building codes means standardization of material and quantity production, with a saving of thousands of dollars. There are hopeful signs that something will be accomplished and we believe it is largely only a matter of the right publicity.

Most of our building codes were devised, to be sure, with the best intentions, in most cases for the restraint of poor and dangerous construction. Since they were promulgated, however, many changes have been made in methods of construction and especially in the use of fireproof materials. These have made it possible to reduce the thickness of walls and permitted of lighter construction in many ways.

The Bureau of Standards working in harmony with the need for housing is carrying on tests that are of incalculable value.

There never was a time when theories were so ruthlessly subjected to the test of facts and it is a good sign of the times, for old theories of government have been put to the test and found wofully lacking, and old and obsolete theories of building and materials are on their way to the junk-heaps.

Building codes were devised to protect the public from the unscrupulous contractor and they are needed in these days of profiteering more than ever. But they can and will be established by scientific tests that will have a national, not merely local, authority.

The Lesson from Chicago

WE believe those of our readers who are not fortunate enough to see the "Bulletin of the Illinois Society of Architects" will be interested in seeing the following regarding the action of the unions after accepting the arbitration agreement and Judge Landis's award. The editor of the "Bulletin" asks "What's the Use":

"The arbitration agreement was finally entered into and the people of Chicago stood aside and watched developments. Most of them never for one moment were misled as to the ultimate outcome. They believed—in fact knew—that with such a man as Judge Landis as Arbiter that the rights of the public would be fully protected and that when his final award was made that it would have the unanimous endorsement not only of industry but of all citizens of Chicago with the exception perhaps of a few disappointed Bolsheviks among the union's official representatives.

"The arbitration proceedings and the final finding are now matters of history as is also the fact that a number of unions who had signed the arbitration proceedings and have on numerous occasions reaffirmed their intent to go along, have repudiated their agreements and locked their men out. This repudiation of the agreement entered into has brought more forcibly to the citizens of Chicago than it could have been by any other means the utter unreliability of any agreement executed by organized labor. It is utterly futile to expect agreements to be kept by organized labor. Agreements are usually and in most cases merely scraps of paper.

"The equity of the award and the fairness of the wage scale granted, the justice in penalizing those trades that refused to remove from their working rules objectionable restrictions, no thoughtful citizen can question.

"The blame for the failure of the unions to accept the Landis awards must be charged directly to the unions' representatives in the Building Trades Council and to no other cause. A most careful inquiry of the workmen themselves has disclosed the fact that the journeymen of all trades are, as a class, satisfied with the wage award given and are anxious and willing to proceed with work even at a lower wage rate than granted by Arbiter Landis but their bosses will not let them. This is the entire story.

"It is therefore evident that the only thing the building industry can do will be to proceed with work under the American plan, recognizing to the last paragraph every provision of every agreement entered into with the unions who are abiding by the award and these unions, if they are wise, will without question proceed with their tasks on any and all buildings working side by side with any and all workmen that may be secured to take the place of those on strike. It would appear that many of the building trades mechanics in Chicago are actually working under a condition of serfdom more autocratic than actual slavery. A slave is at least housed and fed. A striker sometimes gets a strike benefit and sometimes he does not."

Book Reviews

ARCHITECTURAL RENDERING IN WASH. By H. Van Buren Magonigle, F. A. I. A. Architect, Gold Medallist of the Architectural League of New York, Rotch Travelling Scholar, Fellow of the American Institute of Architects, Past President of the Association of the Alumni of the American Academy in Rome, Past President of the Architectural League of New York. With a Preface by Thomas K. Kimball, Past President of the American Institute of Architects. Charles Scribner's Sons, Publishers, New York.

Out of his years of experience as a practising architect with a nation-wide reputation as one of the most artistic and skilful draftsmen in his profession Mr. Magonigle has written a book that fills a unique place and promises to be for many years the authority and text-book on his chosen subject. It shows the full knowledge born of intimate practical experience in the handling of materials and the vision that goes with work that has been always dominated by a high artistic purpose and consideration for beautiful presentation.

The author's own drawings, both in black-and-white and color, have a quality and distinction that excite the admiration of the experienced practitioner and the enthusiasm of the student. There is no other book on the subject that compares with this, either in comprehensiveness or attention to those details that only long experience can make clear and positive in the handling. The mere Table of Contents—The Preliminary Steps, Rendering, Quarter, Half, or Three-Quarter Color, Rendering Sections, Rendering Detail Drawings, Rendering Places, The Properties of Pigments, Free Color and Free Sketching—gives but a cursory idea of the amount of fulness with which all of these topics are discussed. In the chapter on Preliminary Steps, for instance, the author gives a complete outline of the materials and preparation for drawings. We note such sub-heads as Paper, Joining Sheets, Cloth-backed Papers, Selecting the Paper, Mounting, Cleanliness, Transforming Studies to Final Paper, Whites in Pitches of Platforms, Foregrounds, etc., Studies of Larger Scale, Preserving the Surface of the Paper, Penciling in, Rubbing on, Transfer Paper, Lightening up, Toning the Ink, The Line and Its Quality, Planes versus Lines, The Ruling Pen, Free-hand Pens, Shade-Line Drawings, Casting Shadows, Brushes, India Ink, Pigments as Toning Agents.

The same care for detailed and specific instruction marks every chapter with the result of making it possible for the student to attack the most difficult problems with the assurance of at least a full knowledge of the right approach. Perhaps no chapters in the book will prove more valuable than those on The Properties of Pigments and Full Color and Free Sketching. In these Mr. Magonigle gives the results of his own admirable handling of color—many will recall his easel paintings in both oil and water-color—and includes his own and the working palettes of such other distinguished draftsmen as Jules Guérin, Otto R. Eggers, Birch Burdette Long, Frank Hazell, Hobert G. Ripley, and Paul Philippe Cret.

"The book is for the student in the School of Architecture, the draftsman in the office, the novice, and the experienced man."

It has already received high praise from leading teachers in several of the foremost architectural schools, and there is no doubt of its great value as well in the teaching of art in schools given to the study of art in general. The student of design, illustration, and even the painter will find it a book of inestimable value.

The numerous illustrations and diagrams include a colored frontispiece from a water-color drawing by Jules Guérin of the Library of Columbia University and drawings by Otto Eggers, Birch Burdette Long, Paul Philippe Cret, Frank Hazell, Ernest Peixotto, the author, and others add greatly to the illumination of the text.

Of course, beyond all technic lies the intangible element of personality, and it must be a dull reader who will not find inspiration and encouragement in this book. As Mr. Magonigle says in closing: "So much for method and methods; but beyond these lies that inner vision without which all work however skilfully done is empty and soulless."

THE ENJOYMENT OF ARCHITECTURE. By Talbot F. Hamlin. New edition. Fully illustrated. Charles Scribner's Sons, Publishers.

Note.—The following review of Mr. Hamlin's delightful book was written by Colonel W. A. Starrett, who read it on shipboard while on a recent trip to China and Japan:

The attention of any one having the slightest interest in the subject is sure to be arrested by the title of Mr. Hamlin's book, "The Enjoyment of Architecture," and to open it is almost sure to lead one to read it from cover to cover before laying it down, so fascinatingly is the subject unfolded and so clearly is the story told. For, under Mr. Hamlin's skilful handling, it becomes a story, almost a romance.

The book is frankly American and in a way an argument for American architecture, although always in the light of the classical forms. The author opens by speaking to the average cultivated American and adroitly leads him into the subject, not through a maze of technicalities, but by pointing out the pleasure of architecture. The reader's recognition of the very emotions that have always stirred him, now so clearly separated and arranged before him, leads him to the more intelligent contemplation of what he has so long been observing.

Any reflection that after all one is being led into a technical complex is met almost before it can arise, by the frank admission that "there is no greater obstacle to the appreciation of architecture than the fog of criticism that hangs all about it." And from this point the reader is led into a simply told and lucid analysis of the laws of form in architecture. The well-chosen photographic illustrations, together with the simple little pen-and-ink sketches, leave the reader in no doubt if he will but apply himself to the pregnant meaning of each sentence. It is in the introductory chapters that the foundation of the subject is laid.

If the reader can conjure up any justification for the "fog of criticism" after reading the chapters on form and materials, it can easily be dispelled by a moment's reflection upon the continual appeal to the simple requirements of good taste. Through these chapters it is remarkable how completely the author has submerged himself, and his tolerance of divergent views, which, however, he never allows to cast doubt upon the underlying sound principles he is elucidating. He even gives a resounding rap to those who have done violence to the canons, but in no spirit of carping criticism. Rather he makes a constructive protest against those who in his opinion have violated the fundamental principles. But immediately he returns to self-effacement, leading rather than pushing his reader into the subject, and all with a telling subtlety.

The test of the reader's instinct for beauty in architecture will come in the chapters on decorative material and ornament. If he is not thrilled by the discussion and the romantic weaving of the origin and history of ornament, with the discussion of its meaning and uses, then he had better lay down the book, for not only is the text replete with a wealth of instruction but in the skilful handling these chapters fairly vibrate with the whole spirit of the art. It is here that the literary quality of the book seems fairly to merge with the spirit of the subject, and the reader's well-springs of appreciation must indeed be dormant if he is not moved with enthusiasm over the masterful way in which the subject is presented.

In the chapter on planning, the author of necessity drops back to very elementary discussion, for after all he is addressing the layman. It reminds one, however, that heretofore even the architects must have been among the most thoughtful and appreciative of the audience. Instructive as the chapter is it is a welcome breathing space for the more technically trained, and comes as a fitting interlude before the climax of the book, a splendid discussion of style.

Here the author reveals himself as a master of his subject. His literary skill, his enthusiasm, and his profound knowledge join hands in producing a discussion of style that is in itself a classic. The brief but poignant outline of the history of architectural forms, with side-lights on the political and sociological influences, the necessities that governed and the cultural influences, are all interwoven into the fabric of the argument with a consummate skill that is seldom equalled. And not the least of the nature of this splendid discussion is the liberality of the author's view-point.

If the book contained nothing else, the chapter on style would give it standing as a standard text-book, which every lover of good architecture from the veriest tyro to the accomplished practitioner could well afford to follow.

There is a fine conclusion in the chapter on the social value of architecture which one might almost regard as an epilogue, although a short epilogue concludes the volume. It reminds one of the friendly discussion that the author's auditors might have as they were shaking hands preparatory to departing. It reviews the tremendous field that architecture covers and touches upon the profound influences, good and bad, that like architectural and constructional effort produce. The author's virility again asserts itself when he lays squarely at the door of industry and capital their responsibilities and the evil social consequences that are sure to entail upon the neglect or indifference toward this all-important subject.

In reviewing so good a book it might seem a contradiction to suggest that it could be different, but its very excellence suggests the following comments. While the volume has a well-chosen selection of illustrations, one wishes there might be more of them.

Though the book is addressed primarily to the layman, it could well be a guiding text-book for any architect whatever his standing.

GRACE DODGE HOTEL, WASHINGTON, D. C.

Duncan Candler, Architect.

MAIN ENTRANCE, GRACE DODGE HOTEL, WASHINGTON, D. C. Duncan Candler, Architect.

LOUNGE.

LOUNGE, LOOKING INTO LOBBY. Duncan Candler, Architect.

GRACE DODGE HOTEL, WASHINGTON, D. C.

MAIN DINING-ROOM.

VESTIBULE AND LOBBY.

Duncan Candler, Architect.

GRACE DODGE HOTEL, WASHINGTON, D. C.

Edward S. Hewitt, Architect.

RESIDENCE, MR. AND MRS. SIDNEY HOMER (LOUISE HOMER), LAKE GEORGE, N. Y.

DETAILS, RESIDENCE, MR. AND MRS. SIDNEY HOMER (LOUISE HOMER), LAKE GEORGE, N. Y. Edward S. Hewitt, Architect.

PORCH FIREPLACE.

LIVING–ROOM.

Edward S. Hewitt, Architect.

RESIDENCE, MR. AND MRS. SIDNEY HOMER (LOUISE HOMER), LAKE GEORGE, N. Y.

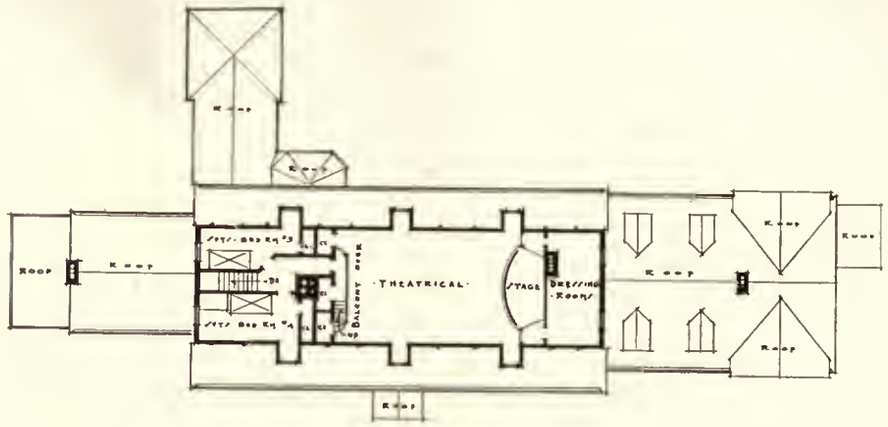
DINING–ROOM.

STUDY.

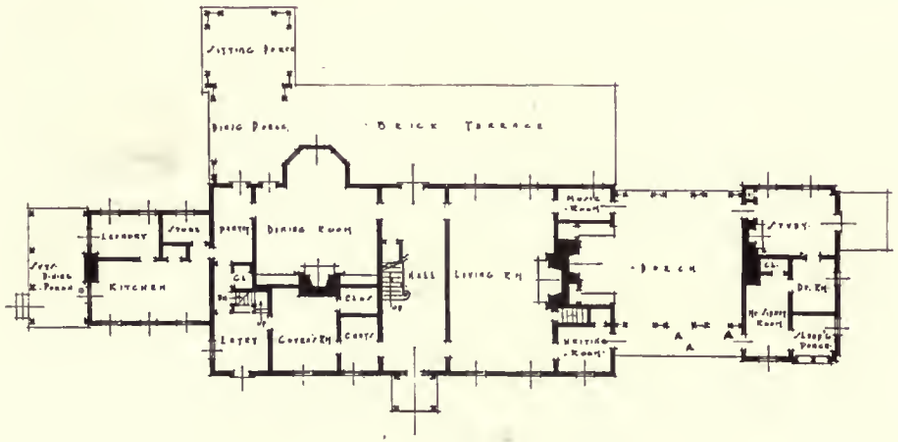
Edward S. Hewitt, Architect.

RESIDENCE, MR. AND MRS. SIDNEY HOMER (LOUISE HOMER), LAKE GEORGE, N. Y.

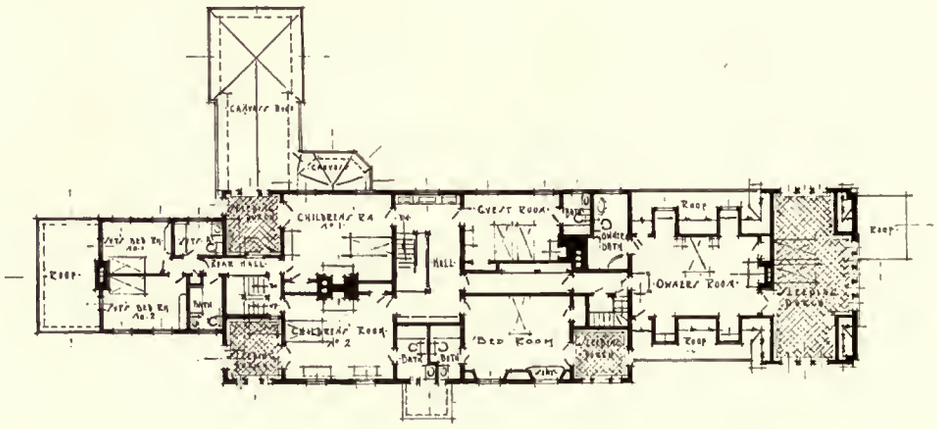
HALL.



ATTIC FLOOR PLAN
SCALE 1/8"-1'-0"



FIRST FLOOR PLAN
SCALE 1/8" - 1'-0"



SECOND FLOOR PLAN

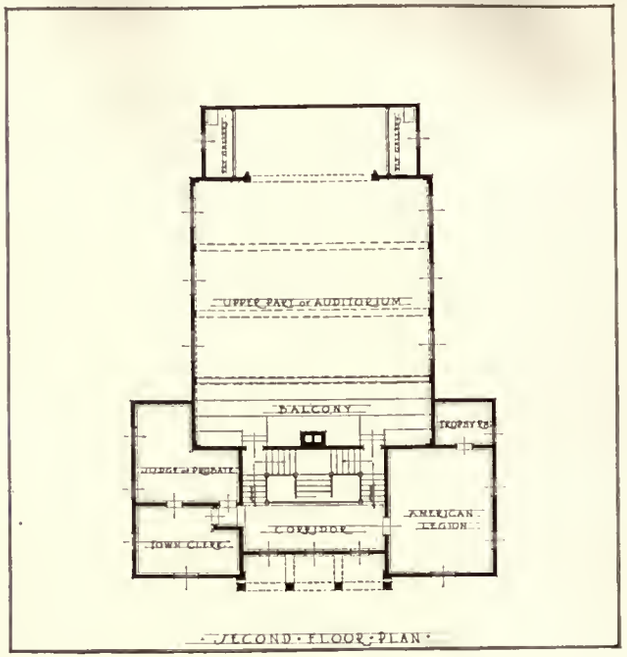
RESIDENCE, MR. AND MRS. SIDNEY HOMER (LOUISE HOMER), LAKE GEORGE, N. Y.

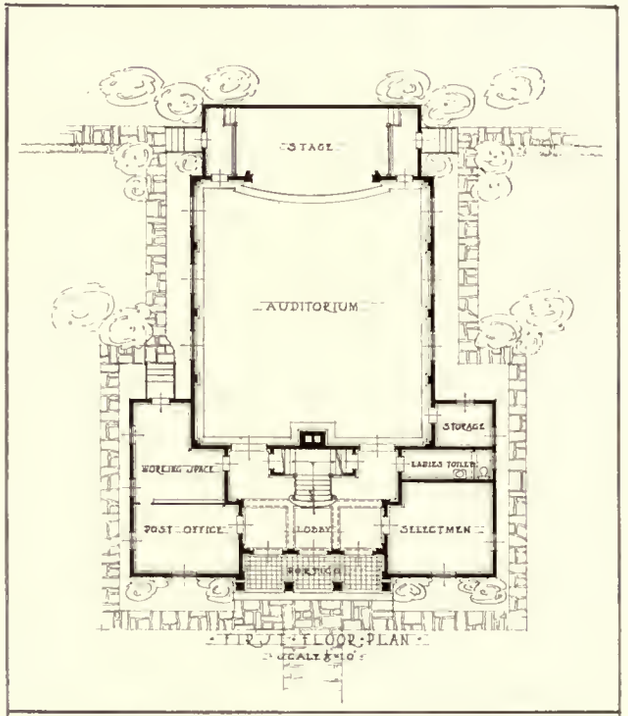
Edward S. Hewitt, Architect.

MEMORIAL TOWN HALL, LYME, CONN.

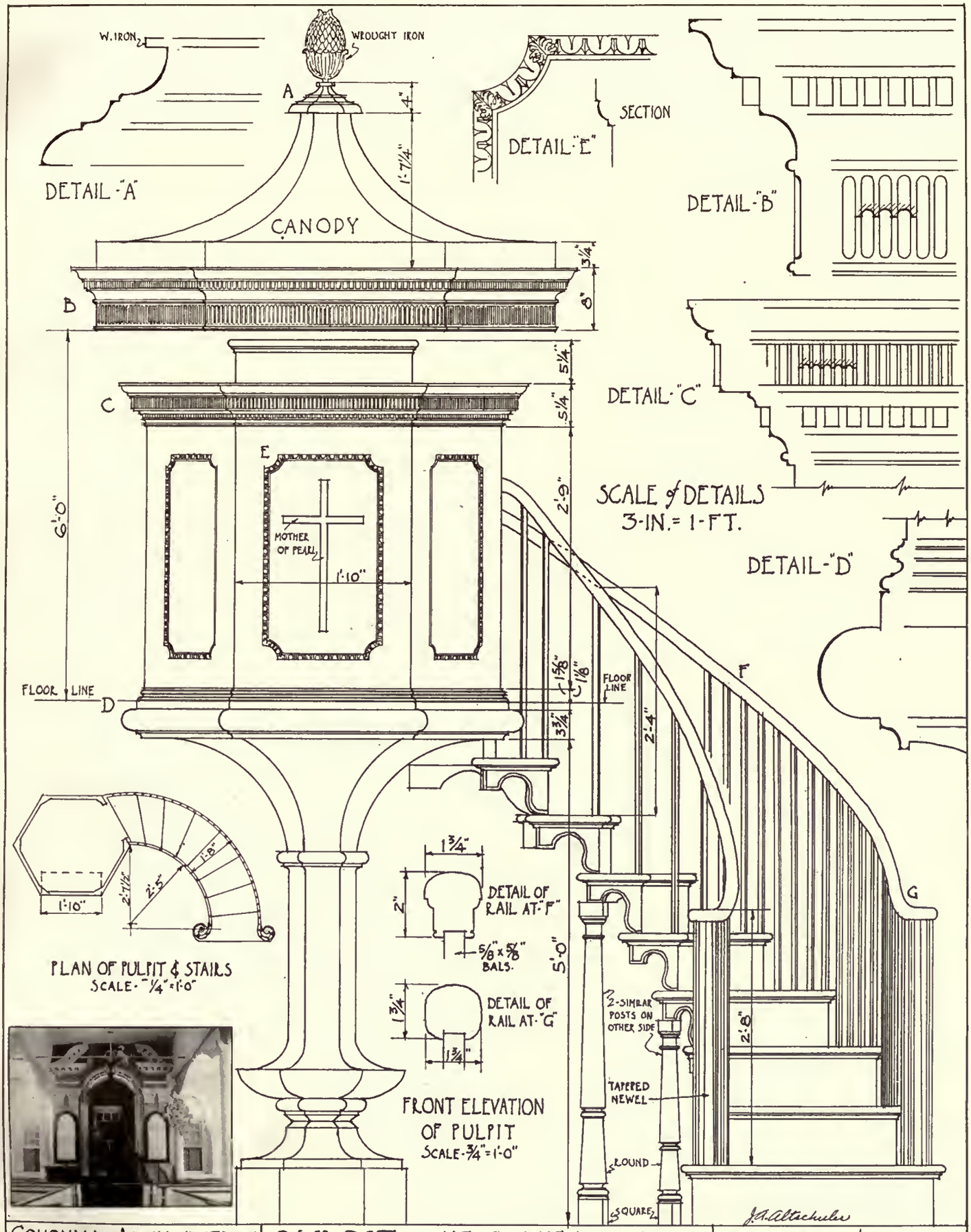
Payne, Griswold & Keefe, Architects.

LOBBY AND MAIN STAIRCASE, MEMORIAL TOWN HALL, LYME, CONN.

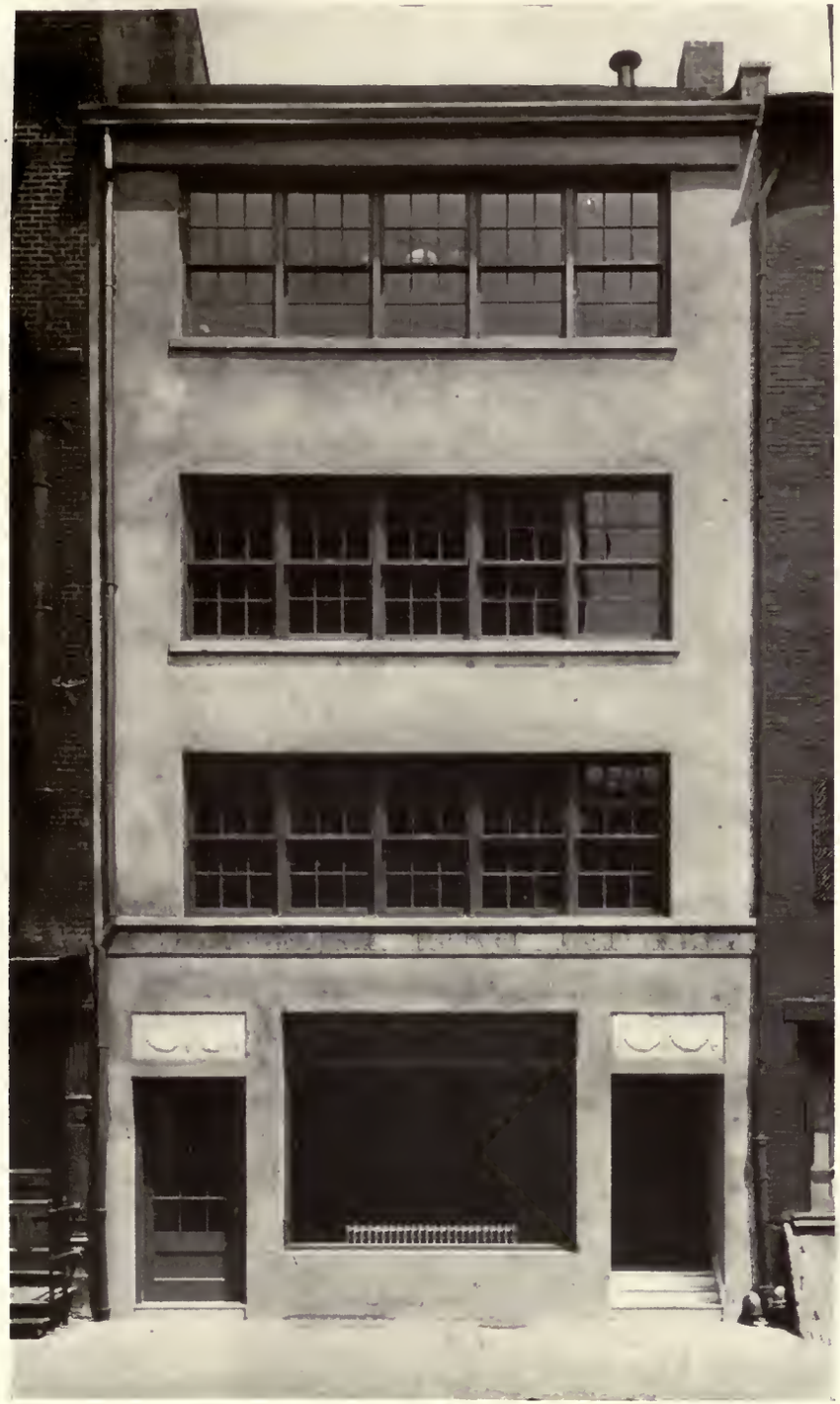




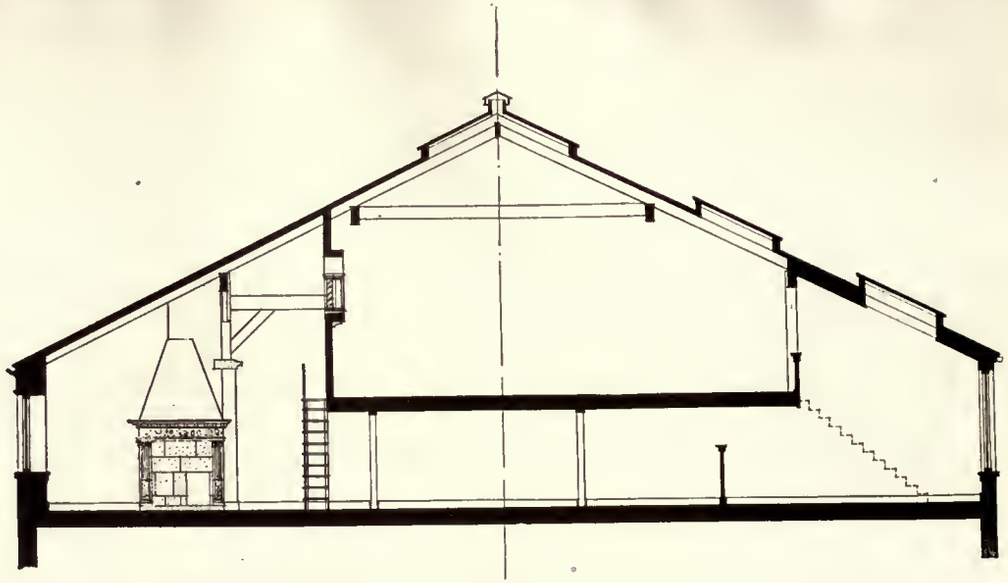
Payne, Griswold & Keefe, Architects.



COLONIAL ARCHITECTURE of the CAROLINAS	PULPIT - ST. JAMES CHURCH DATE - 1713 - OTRANTO - S. C.	MEASURED & DRAWN by J. A. ALTSCHULER



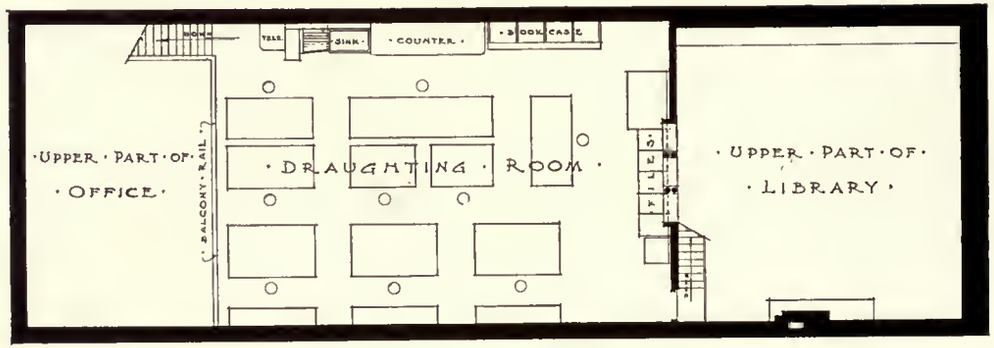
OFFICE BUILDING, 119 BROAD STREET, NEW YORK (ALTERATION).

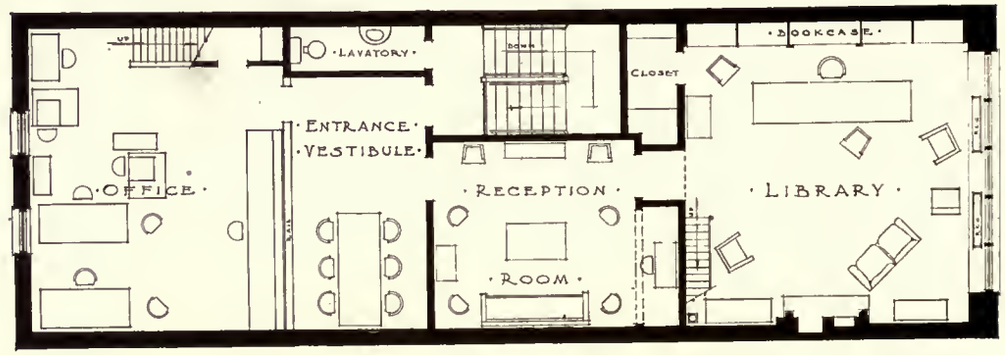


The land on which this building was built was filled in shortly after the Revolution, but fire destroyed all the original buildings.

We are unable to fix a date for the old building, but the slate roof, covered over by successive metal roofings, was held in place by hand-wrought nails, and the old rafters are single pieces forty feet long. The foundation is on a cribbing of logs covered over by two layers of three-inch white pine plank caulked as a wooden ship is caulked.

In New York City light is a rare element, and by altering the old building to our uses we have acquired it in abundance. Besides, evading the pursuing landlord quite satisfactorily and having an arrangement of office space suited to our own manner of doing business.





PLANS OF OFFICES OF CLINTON MACKENZIE, 119 BROAD STREET, NEW YORK.

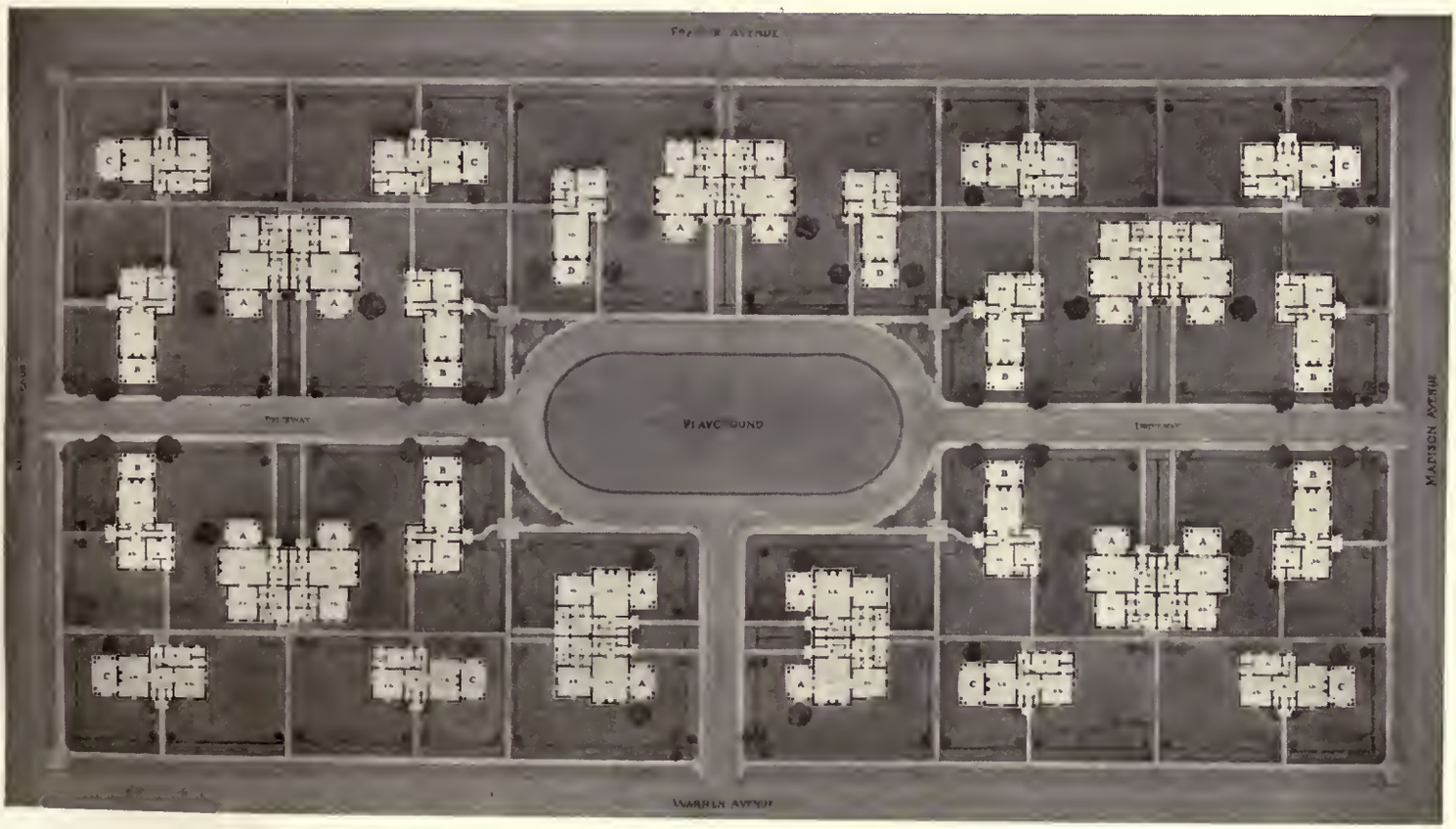
Clinton Mackenzie, Architect.

DRAFTING–ROOM.

LIBRARY.

Clinton Mackenzie, Architect.

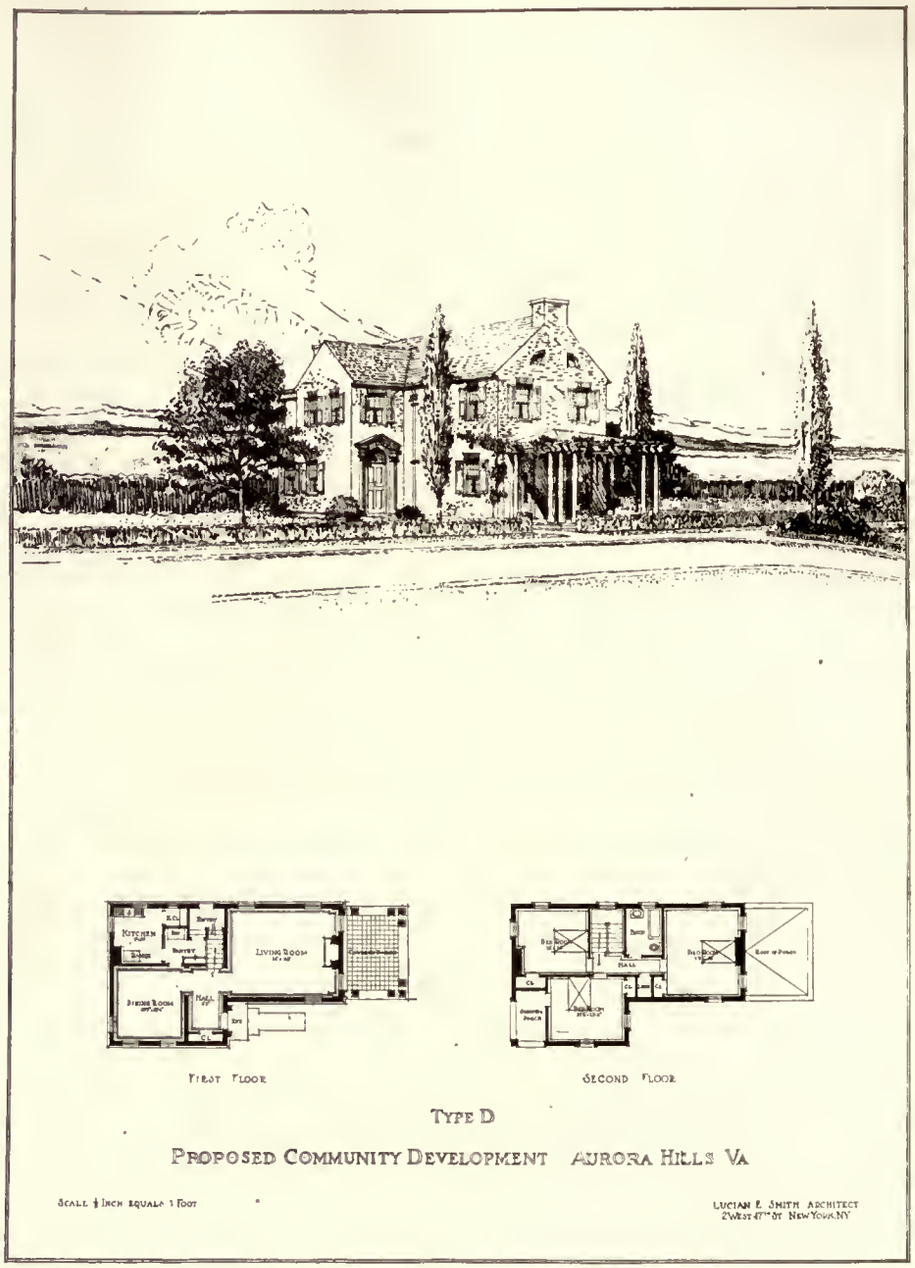
LIBRARY, OFFICES OF CLINTON MACKENZIE (ARCHITECT) 119 BROAD STREET, NEW YORK.



PROPOSED COMMUNITY DEVELOPMENT, AURORA HILLS, VA.

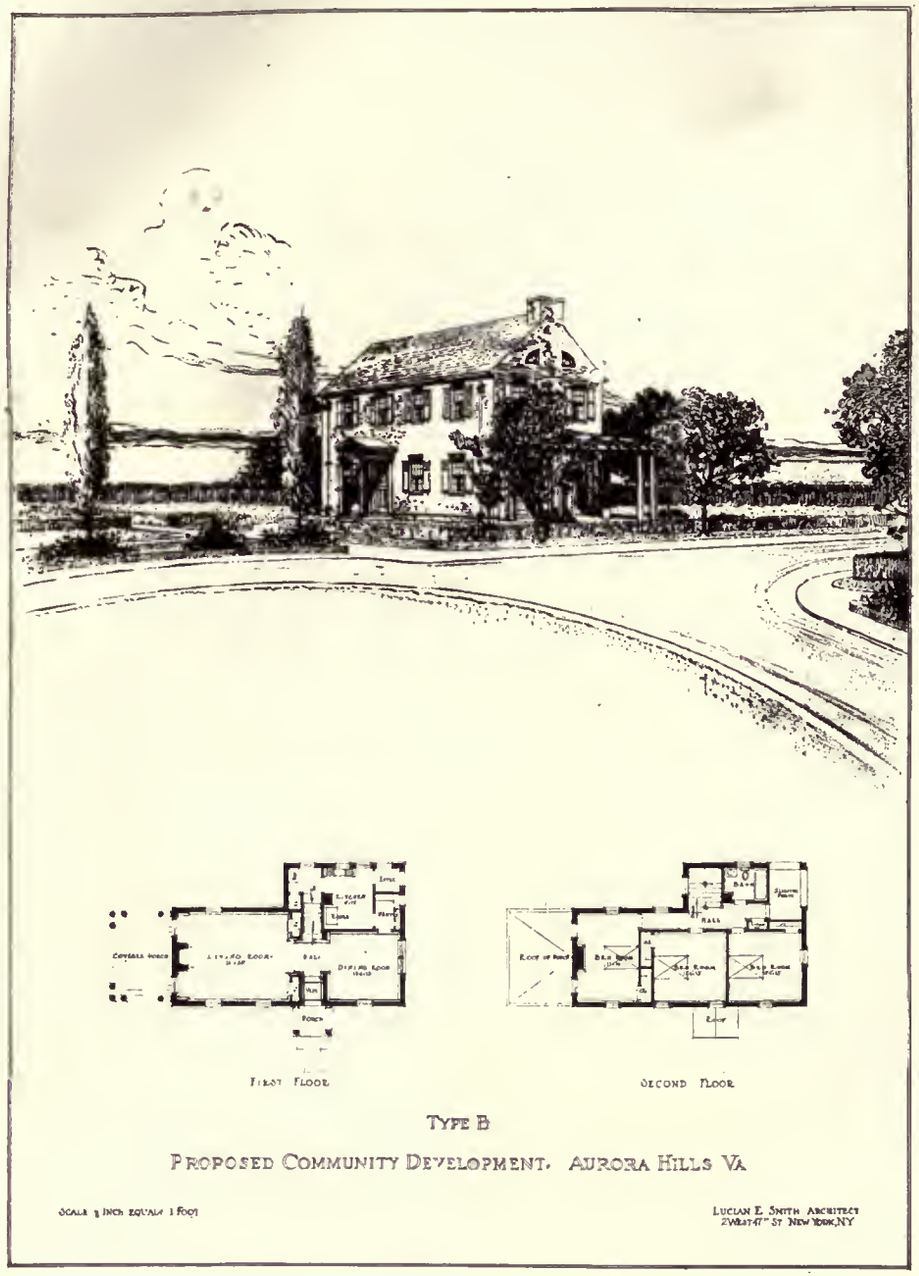
Lucian E. Smith, Architect.

FIRST FLOOR
SECOND FLOOR
TYPE A
PROPOSED COMMUNITY DEVELOPMENT – AURORA HILLS VA
SCALE ⅛ INCH EQUALS 1 FOOT
LUCIAN E. SMITH ARCHITECT
2 WEST 47TH ST. NEW YORK, N.Y.


FIRST FLOOR
SECOND FLOOR
TYPE D
PROPOSED COMMUNITY DEVELOPMENT AURORA HILLS VA
SCALE ⅛ INCH EQUALS 1 FOOT
LUCIAN E. SMITH ARCHITECT
2 WEST 47TH ST. NEW YORK, N.Y.

PROPOSED COMMUNITY DEVELOPMENT, AURORA HILLS, VA.

Lucian E. Smith, Architect.


FIRST FLOOR
SECOND FLOOR
TYPE B
PROPOSED COMMUNITY DEVELOPMENT. AURORA HILLS VA
SCALE ⅛ INCH EQUALS 1 FOOT
LUCIAN E. SMITH ARCHITECT
2 WEST 47TH ST NEW YORK, N.Y.

PROPOSED COMMUNITY DEVELOPMENT, AURORA HILLS, VA.

FIRST FLOOR
SECOND FLOOR
TYPE C
PROPOSED COMMUNITY DEVELOPMENT - AURORA HILLS VA
SCALE ⅛ INCH EQUALS FOOT
LUCIAN E. SMITH ARCHITECT
2 WEST 47TH ST NEW YORK N.Y.

Lucian E. Smith, Architect.

A Community Development in Virginia

Lucian E. Smith, Architect

THE history of housing communities shows many projects for bettering conditions of the laboring classes and of the poor, both in large cities and in the country, but few attempts have been made to provide the man of moderate means with better-designed and better-built houses of relatively small cost.

The speculative builder and the owner with land to exploit seem slow in realizing that it is really bad business to sell to the uninitiated home-buyer houses which are with but few exceptions unattractive, badly planned, and so cheaply built that repairs are constantly required to keep the property not only from deteriorating but even to keep it habitable for men and women who have a right, by reason of their breeding and education, to houses which are attractively designed, conveniently planned, warm in winter, complete in their sanitary arrangements, and which do not require a constant expenditure of money to make good defects of careless and cheap construction.

This project has been conceived and developed with the basic idea of providing homes for people of refinement who appreciate a properly designed and well-built house. The prime requisite for such houses is reasonable cost.

A block 600 feet by 300 feet has been laid out to provide for 32 building lots, ranging from 50 feet by 88 feet to 50 feet by 100 feet. Eighteen per cent of the plottage has been reserved for driveways of communication and a large playground for children. The grounds have been laid out with hedges, trees, and shrubs to produce an attractive ensemble. Service walks have been put in to facilitate delivery of supplies and to keep such service from the fronts of the houses.

The houses themselves have been arranged around a large central court, containing the playground and two other courts to the east and west. A certain percentage of the houses face these courts, and the remainder face the streets surrounding the block.

Advantage has been taken of the principle of setting forward or back alternate houses in order to give the owners the benefit of wide open spaces between the houses. Sufficient variety has been introduced into the design to avoid monotony in appearance, and yet the same type of architecture prevails throughout in order to give harmony to the whole. The style of architecture adopted is Virginia Colonial as most fitting to the locality. The exteriors are of brick carefully laid up. The porches, entrance doorways, window-frames, and sash are painted white, with the shutters green. The slate roofs make for permanence and economy.

The plans of the houses are sufficiently varied to meet the requirements of families of different sizes and tastes. Four types are employed. Type A is a two-family house, each with four bedrooms; type B is a detached house with three bedrooms; type C is the largest detached house with four bedrooms; and type D is the smallest detached house with three bedrooms.

Ample provision is made in basements for the storage of coal and provisions. Separate water-closets and laundry-trays of substantial make with wood-slat platforms are provided. Entrance directly to the basements from out-of-doors permits of wet clothes being taken to the drying-yard without going through the kitchen.

The first floors have exceptionally large living-rooms, large dining-rooms, coat-rooms, butler's pantries, kitchens, and storage closets.

Ample space is given for refrigerators on rear porches, preventing the tracking up of the kitchens by the delivery of ice.

The second floors in addition to the bedrooms above noted, each of which is provided with ample closet space, comprise cedar-lined linen-closets, bathrooms, and sleeping-porches. The attic space is readily accessible for storage purposes.

The materials of construction and workmanship are of the best, and are of a similar character to houses of much higher price. The soil is clay, which necessitates the especial care which has been taken to provide for dry cellars. The walls and floors of the cellars are waterproofed, rendering the walls and floors dry for all time. The ceiling of the cellar is plastered to keep the house warm in winter, a precaution not met with in the usual house on the market for sale. The footings are of concrete, and the foundation walls are built of the best hard-burned brick laid up in cement mortar instead of lime.

All supporting columns and girders are of steel, properly protected by painting and amply figured to carry the load of the superstructure without cracking the plaster or causing doors to stick. All chimneys are lined with terra-cotta flue lining laid up in cement mortar.

The sidewalks and steps are substantially built of concrete and properly graded to carry off water.

The structural timber is of sound No. 1 Virginia pine and substantially put together to avoid undue shrinkage and settlement.

First floors are double to insure warmth, and the finished floors are laid over heavy building-paper. All exterior trim is of No. 1 clean, sound Florida Gulf cypress. The porch columns are patent lock-joint columns to insure against the wood opening up through shrinkage. Porches are of generous size. The sleeping-porches are canvas-covered and painted.

Especial care has been taken with the interior finish, woodwork, and doors. No stock trim is used.

The mantels are especially designed with brick or tile facings. The stairs are made unusual features of the house, all being especially designed, not of the usual stock patterns.

The first-story floors are of white oak properly finished with wax, which is easily kept in order by rubbing with a cloth and a little prepared wax from time to time. The second-story floors are of edge grain hard pine well driven up, smoothed and varnished.

The plastering of the houses is a high-grade patent wall plaster. Ceilings of first-floor rooms, excepting kitchens, are sand-finished, which gives a most artistic effect when treated with water-color. Metal corner beads are used for all exterior corners to prevent damage to the plaster.

Attention is called to the treatment of the bathrooms. The plumbing is of the best character with modern pedestal lavatories, which allow of cleaning on four sides, built-in tubs of latest design, and low-down porcelain tank water-closets. The floors are of ceramic mosaic tile with wainscot of the same material; the walls above and ceilings are finished in the highest grade of elastic enamel. Each bath-

room is provided with medicine-closet with plate-glass mirror. All fixtures except closets are provided with hot and cold water.

A forty-gallon galvanized-iron range boiler is provided in each kitchen to assure an ample supply of hot water. Each house is provided with a non-freezing brass sill cock for hose connection. Laundry-trays are of porcelain enamel, white and clean-looking, in place of the usual soapstone or albertine.

The kitchen sink is also pure white porcelain enamel, with back cast on the sink itself to prevent the collection of grease and dirt.

The heating system is hot water, carefully calculated for each house to give the maximum efficiency. The "Honeywell" system is included in each installation, which allows of high temperature in extreme weather with the minimum of fuel consumption. The radiators are of the simplest design to avoid collection of dust and dirt. They are painted to match woodwork of rooms.

The houses are wired in flexible armored conduit, which gives a maximum protection against fire. Electric bells are provided with buzzers from dining-rooms to kitchens. Base receptacles have been put in living-rooms for reading-lamps. The lighting fixtures embody the most up-to-date ideas in interior lighting and finish. Especial attention is called to the indirect dining-room fixtures used in place of the old-fashioned dome lights.

A novel feature of the bedroom-lighting is the dresser lights, with wire frames provided, so that any color shade made may be used to correspond with the color scheme of the room.

Pilot switches are also used so that upper and lower hall lights may be turned on or off from either up or down stairs.

In brief, these reasonable-sized houses are thoroughly well built and finished and provided with many up-to-date conveniences only met with in houses of a higher cost. Not a dollar has been wasted on superfluous decoration to the sacrifice of good and lasting construction.

Homes of this size and cost are usually "built to sell." These houses are built to be owned and enjoyed by men and their families who appreciate homes in good taste, and which they can be confident are honestly built.

Furthermore, an owner of one of these houses has the assurance that he is protected for all time by wise building restrictions, formulated for the common good; that his neighbors are people of his own class, and that his children are growing up amid artistic and attractive surroundings which will have a lasting effect for good upon their characters.

The Memorial Town Hall at Old Lyme, Conn.

Payne, Griswold & Keefe, Architects

THE project was first talked of a few months after the signing of the armistice, when the people were anxious to do something for those who had given their services in the World War. The natural thought was to erect some sort of a building as a memorial, and the need of a public building in the town, coupled with the thought of doing

The memorial town hall, Lyme, Conn.

something to perpetuate the deeds of those who were in the service, gave birth to the idea of a Memorial Town Hall.

Early in 1919 a general meeting of the townsfolk was held, and the Old Lyme Memorial Town Hall Committee was appointed. From this committee the Finance Committee, Building Committee, and Entertainment Committee were formed.

The Finance Committee set about devising ways and means to raise funds. The town promised to contribute $10,000 of public money if the committee raised $15,000. The latter sum was speedily raised by public subscription. Two street fairs, held in 1920 and 1921, netted a total of $5,500. The total amount of funds required was raised prior to the completion of the building, the total cost being slightly over $38,000, or approximately 31.4 cents per cubic foot. The Artists Association of Old Lyme entered into the project enthusiastically, at the beginning promising that they would finance 50 per cent of the cost of the building providing they could have exclusive use of the building one month each year for their annual exhibit. Later they withdrew their promise as considerable criticism from several sources regarding the giving of the exclusive use of the building to any one was caused.

The Building Committee invited several firms of architects to submit examples of their work, and after several meetings selected the firm of Payne, Griswold & Keefe to prepare the drawings and specifications. This firm of architects is composed of three ex-service men who have become associated since the World War.

The auditorium.

The Grace Dodge Hotel, Washington, D. C.

Duncan Candler, Architect

BEFORE the signing of the armistice plans had been made for a building of a different character, which was intended as supplementary to the government housing for women, in the immediate vicinity. This was to be a long, low, reinforced-concrete structure, six stories high, and ap-

The hotel and tea house.

plication had been made to Mr. Baruch, chairman of the War Industries Board, for the required materials. Ultimately this building was to be used for permanent housing accommodations.

With the armistice came changed conditions and requirements which necessitated the development of a new design, and permitted the use of materials hitherto prohibited.

It was decided to make the building a high-class hotel for women, the location lending itself admirably to the scheme. It was to be planned so that it would insure a proper return on the investment, which it is calculated to do, and not be institutional either in character or management.

In order that the building should pay its way, provision had to be made for at least 400 persons, so it was planned with 343 single rooms and 28 double rooms to house temporary and permanent guests, with comfort and convenience at reasonable rates. Various units were adopted on the bedroom floors: bedrooms with public baths and toilets, bedrooms with connecting shower-baths and toilets, and bedrooms with private baths.

After the estimates were received and at the time of the signing of the contract a certain amount of money was available. By the co-operation of the committee, architect, and builder, and by the substitution of certain materials during the construction, the desired result has been obtained together with additional features, without exceeding the available amount by more than 6½ per cent, of which 3 per cent was due to unforeseen foundation conditions. The building was built during the peak of prices and finished at the present time, with only a slight reduction in materials, but not in labor. Therefore, all the parties concerned are pleased with the way the cost has been handled.

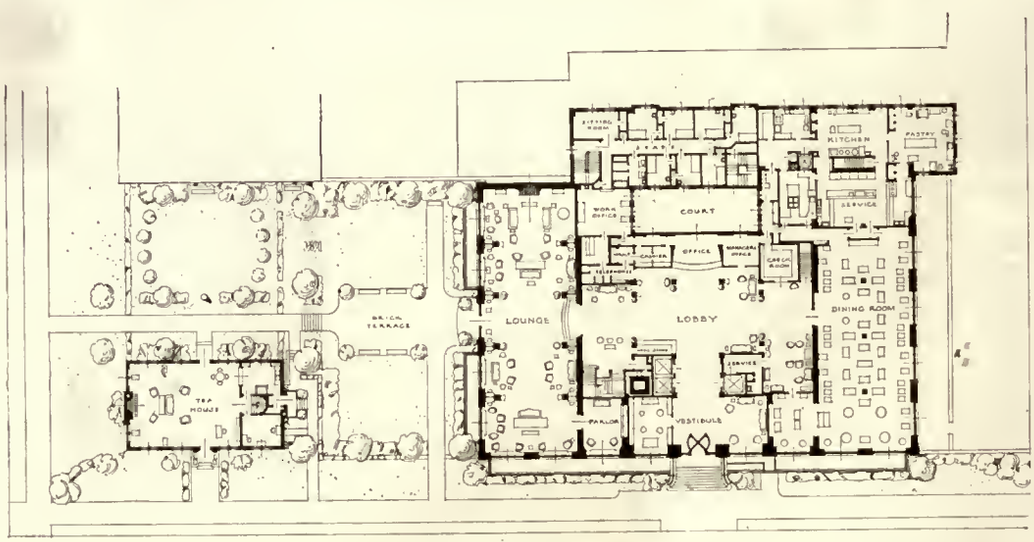
The building was designed to give a strong simple effect, with practically all decoration eliminated. The mass was based on Italian lines for simplicity and broadness. For the last two or three years, and at the present time, the cost of building has been so great that such a restricted policy has been advisable to keep work within the limits of good investment and conservative effect. It was desirable to get the best possible effect with simple materials.

An extra story may be added at any time as the foundations and structural supports have been built for such a possibility. The building would then not exceed, in height, the limit allowed for buildings in the vicinity of the Union Station. The ventilating devices, elevator, pent-house, and water-tanks, located above the roof, are hidden and incorporated in the design.

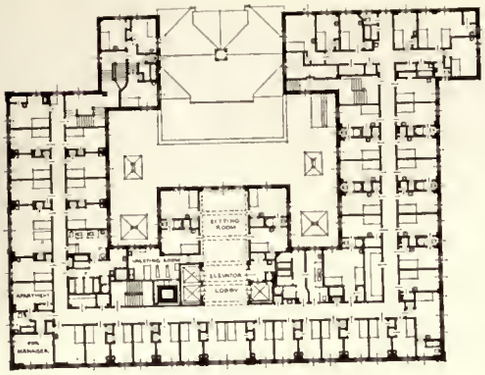
After the signing of the armistice steel became available and other materials on which the restrictions had been very severe. The building was built of structural steel on grillage foundations, with interlocking tile exterior walls faced with buff brick and trimmed with cut cast stone, to harmonize with the brick. There are reinforced concrete floor arches and cement floors throughout, except on main floor, where lobby and dining-room are of terrazzo, laid in designs of different colors, and the lounge, where the floor is of oak.

The main and garden entrances are filled with ornamental iron of Renaissance design. A large plaque over the main entrance is of cut cast stone, interrupting the band course, above which are placed three large flagpoles. Over the garden entrance there is another large flagpole.

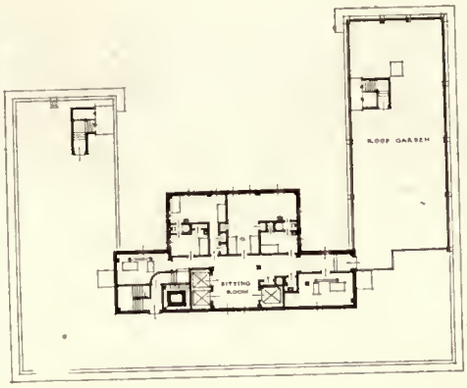
The service entrance for supplies, trunk and help's entrance is placed at the rear, from an alley, and gives into a generous centrally placed freight lobby, as shown on plan. Control of the incoming supplies is provided. No bedrooms for servants are provided in the building, as it is customary



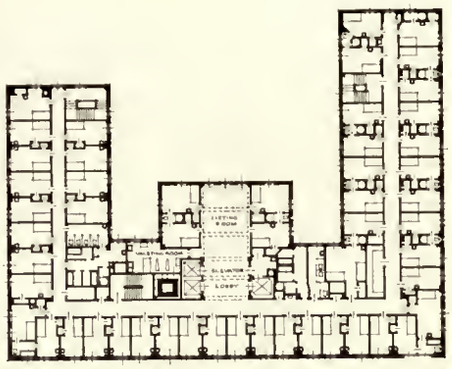
MAIN FLOOR PLAN



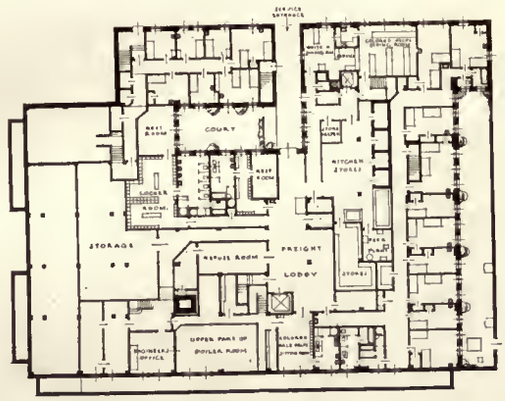
SECOND FLOOR PLAN



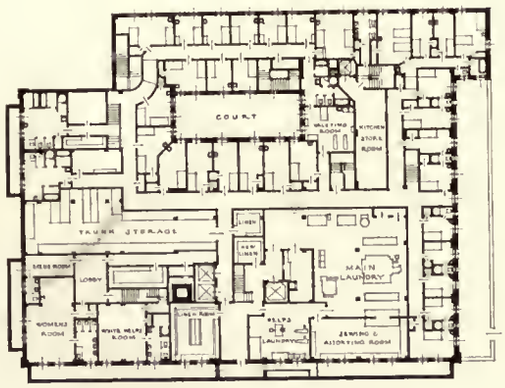
ROOF PLAN



TYPICAL FLOOR PLAN



GROUND FLOOR PLAN



FIRST FLOOR PLAN

in Washington for the help to live in their own homes. On each floor there is a service lobby, in connection with the service elevator, with sink, etc.

The hotel has a beauty parlor, shoe-shining parlor, etc., and a ladies' apparel shop, and house laundry, and help's laundry. Locker rooms, toilets, and rest-rooms for black and white female help; locker and toilet rooms for black and white male help; and dining-rooms for the white and black help are provided. In connection with the working force there is a main office, working office, and checking room, also staff bedrooms.

Generous allotment of space is made on the main floor for social activities. Dining-room for guests and for the outside public to seat 250 persons, also private dining-room, a kitchen and its dependencies, refrigerating system, and ventilating system are provided.

Interior of tea house.

On the bedroom floors, the single rooms are about 8 by 14, and the double rooms are of ample size for individual furnishings. For guests there is a good range of prices. Single rooms are from $1.50 per day to $4.00 with private bath, and the double rooms $3.50 to $5.00 per day. On each floor there is a sitting room, centrally and pleasantly situated, also valeting room, where either self-service or paid service may be had.

Decorative treatment is restricted—the main floor receiving the only embellishment. The lounge of this floor has rough plaster walls, fluted piers, a rough, ornamental plaster ceiling, oak floor and wainscoting to chair height. The vestibule and lobby have beamed ceilings of rough plaster, terrazzo floors designed in colors, oak wainscoting 7 feet 6 inches high, and double folding glass doors between lobby and lounge. The dining-room walls and ceiling are rough plaster, with ornamental moulding at ceiling, the floor is of terrazzo and mirrored doors open into the lobby.

With the opening of the Grace Dodge Hotel, for the first time the name of the Young Women's Christian Association is associated with a high-class hostelry equipment and twenty-four-hour daily hotel service, built and maintained for the use of women of leisure as well as the self-supporting woman, without restriction or rule. The Grace Dodge is the first contribution made by the Association to women of this type. Hitherto its efforts have been confined to boarding homes for girls and women of limited resources and wages, for whom it yearly maintains 8,000 beds, and housed 50,086 girls last year in New York City alone.

"Every effort has been made to make the hotel comfortable and pleasant, and yet inexpensive," said Mrs. John D. Rockefeller, Jr., Chairman of the Housing Committee, under whose personal direction the hotel has been built. "All the rooms are absolutely outside rooms with sunlight. The interior decorations and furnishings of the entire building are by Helen Criss.

Announcements

Making a Staple out of an Intricate Specialty.—This has been accomplished by the manufacturers of the magnesite stucco. It has been brought about by the discovery of a method of making a dry mixture of the magnesite cement and the chloride of magnesia, a combination which all familiar with the use of magnesite know is necessary in order to make magnesite suitable for floors or stucco.

The reason heretofore for not having these materials mixed together and shipped dry is that it has been considered a chemical impossibility, on account of the inclination of chloride, even though dried to the fullest extent to start with, to gradually take the moisture from the air and liquefy, resulting in turning the mixture into stone.

By continued experiments and perseverance, and the assistance of several of the best chemists in the country, the desired result has been brought about and the concern manufacturing this new material is now fully equipped and is actually shipping the product dry with nothing to be added at the building but water.

Among the many advantages of magnesite cement shipped in this manner are the greatest saving in freight, the simplifying of storage and application, and the avoidance of errors in the mixing and application of the material.

Nairn Official Sails on the "Aquitania."—Mr. Peter Campbell, treasurer and general manager of the Nairn Linoleum Company, Kearny, N. J., largest manufacturers of linoleum in the world, sailed on Tuesday, October 4, on the *S.S. Aquitania.* The trip is a business one, and will include visits to England and Scotland.

Leeds & Lippincott Company announce the signing of a contract with the George A. Fuller Company, of New York, for the building of an addition to Haddon Hall, Atlantic City, from plans prepared by Rankin, Kellogg & Crane, architects, of Philadelphia, Pa.

The new boardwalk wing will be directly back of the stores, arcade, and pavilions which were built last year. The height will be twelve stories and the frontage toward the boardwalk one hundred and fifty feet and on North Carolina Avenue sixty-two feet. It will be of fireproof construction of steel and brick with terra-cotta trimmings and a granite base course. The first three stories will be faced with Indiana limestone.

The new structure will contain 147 bedrooms and 147 baths—most of them with direct view of the ocean—and public space, parlors, and exchanges. With this addition the capacity of Chalfonte-Haddon Hall will be about 1,200 persons.

Work commenced in October, 1921, and will be completed in time for the summer season of 1922.

The United States Gypsum Co.'s Syanized Plaster.—Up to a year ago but little advance had been made in the manufacture of gypsum wall-plaster since four thousand years ago when the Egyptians first used this material in their temples and pyramids. Other building materials have been improved for convenience, practicability, or durability, but gypsum plaster remained fundamentally the same as when originated by the ancients.

After twelve months of complete test, however, the United States Gypsum Company announces that the merits claimed for a new process of plaster manufacture have been proved completely. Great importance is attached to the success of this method by officials of the company, who point out that the new plaster overcomes difficulties that have been encountered by workmen and builders for thousands of years. Increased efficiency of plaster-workers is a natural result, combined with an economy that has gratified users everywhere.

The plaster made by the new process is known as Syanized Plaster. This process consists of sealing each minute particle of gypsum against atmospheric moisture. The plaster loses none of its sand-carrying capacity, even when stored for many months. It does not go "dead" while in storage, and being always "fresh," assures full coverage. Other economies of this plaster are the rapidity with which it takes the water in mixing and its unusual plasticity under the trowel.

The manufacturers of Syanized Plaster report that the product has been standardized throughout the country at the various United States Gypsum Company plants.

Gillis & Geoghegan, 540 West Broadway, New York, have just issued a new 20-page, 8½ x 11-inch, two-color catalogue. It is fully illustrated with photographs of actual installations of G & G Telescopic Hoists, as used for handling ash-cans, barrels, trays, and other loads. It also contains two forms of specification, for each model, one a very short form and another which describes the various parts of a complete telescopic hoist installation.

Any one interested may obtain a copy by writing to the above firm.

Mr. Frank E. Fowler, formerly of the firm of Fowler, Capelle & Troutman, architects, Evansville, Ind., is directing architectural work for the Consolidated Realty and Theatres Corporation, 332 South Michigan Boulevard, Chicago. Samples and catalogues requested.

Mr. Edwin S. Coy and Mr. Ralph M. Rice are pleased to announce their partnership for the general practice of architecture, under the name of Coy & Rice, at 297 Madison Avenue, New York.

Mr. Moise H. Goldstein wishes to inform his friends that after October 1 he and his associates, Mr. Thomas M. Harllee, Mr. Nathaniel Cortlandt Curtis, Mr. Frederick D. Parham, and Mr. Nelvil C. Settoon, will be in the new Hibernia Building, Suite 1105–1108, New Orleans.

John J. Klaber, architect, announces the removal of his office to No. 103 Park Avenue, New York City.

Theo. L. Perrier, architect, New Orleans, La., advises us that he has moved his office to 305 Marine Bank Building.

F. Rosenheim, architect, F. A. I. A., announces the removal of his offices to Suite 402, Pacific Mutual Building, Los Angeles.

The A. P. Swoyer Co. merchandise stock, at 17 North 7th Street, Philadelphia, has been purchased by and the premises formerly occupied by Swoyer leased to U. T.

(*Continued on page* 351)

Dynamic Symmetry and Modern Architecture

By Jay Hambidge

THE great weakness of architecture to-day lies in the fact that it does not disclose concrete proportion of the right type. We might say that architecture to-day is almost without proportion, indeed it could hardly be otherwise. The prevailing practice of putting together unrelated design elements as they are lifted or adapted from the sources of the past has resulted in a hodgepodge. When we compare our design with that of the past we find it weak where the old work was strong. The most characteristic element of the design of the past is the bonding or knitting together of composing units. This is due to the use of proportion. A better word would be symmetry.

Very few architects or designers to-day know that the base of design is a certain element of formality which depends upon symmetry. As a matter of fact design cannot exist without symmetry. As soon as we put intention into our work we introduce symmetry of some sort.

We must turn to the Greek for the correct meaning of symmetry. To the classic designer it meant simply the relation of the part to the whole. The relation of a man's hand length to this stature would be an example of symmetry. The height of a column compared to the height or width of an abacus, or column and entablature relationship, or both of these to the building as a whole, would be spoken of by the Greek as symmetry.

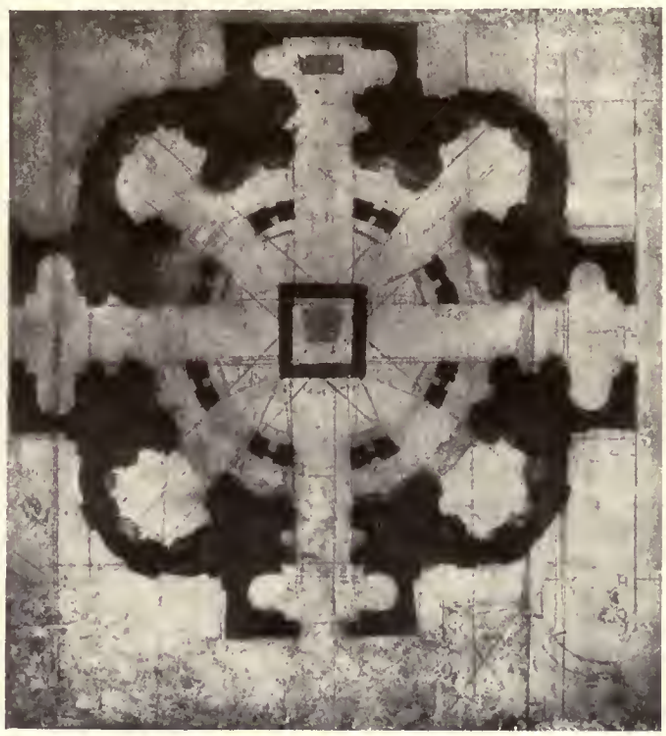


Figure 1.

But there is something more to symmetry than interrelationship of parts. There is the design conception as a whole. This is the dominating symmetry factor. When this is fixed everything else depends upon it. The design history of the past shows us that artists have fixed this dominating symmetry in at least two ways: one by the use of the regular figures of geometry such as the square and the equilateral triangle or by lengths of line determined by some measuring unit, the other by employing areas possessing peculiar properties of measurableness.

An example of the first method is furnished by an architectural ground plan by Michelangelo. I found this plan, with a number of others of like character, in the Casa Buonarotti at Florence last summer. See Figure 1. To my knowledge these plans have never been published.

The importance of this design to the modern architect and artist lies in the fact that it is an excellent illustration of the conscious use of symmetry by an admittedly great designer. It will be noticed that certain parts of this plan are heavily inked while other parts are defined by simple lines which evidently were not to appear when the design was completed. These lines represent symmetry construction. The basis of the theme is a square divided into eight sections. The intersections of the ruled lines furnish points which were utilized by Michelangelo to fix or correlate the elements of his creation. These lines and the general method of their use show us beyond question that the artist had in mind the creation of a plan the details of which would be united and bound together in much the same way as are the composing elements of a crystal. In other words, Michelangelo had in mind the production of a plan which would be an entity or of such interdependence of part and whole that the result would have definite character.

In this connection it would be well for us to remember that design character is dependable upon definite correlation. A design may possess two kinds of character, that of the creating artist and that of the design itself. Without the latter design does not exist.

If necessary we could reduce Michelangelo's building plan to arithmetical terms and thereby explain in detail the actual relationship of each part to every other part and to the whole. In this type of symmetry, however, this is not necessary. It is sufficiently clear as it stands.

Michelangelo has used in this plan a type of symmetry which is characteristic of that which was employed throughout the Middle Ages. This type of symmetry has been given the name "static" and, in nature, is best exemplified by the crystal.

As has been said, symmetry must be present before design can exist. If this be true then there must be times when design and its consequent symmetry is created without the artist being aware that the symmetry is there. This frequently happens, but such symmetry is always of a very low grade. We find it in the work of savages and in the design produced during decadent or formative periods. Symmetry to the savage probably represents the intuitive application of rhythm of much the same kind found in his dances and songs. While the savage and the decadent, or immature designers, work and have worked without a conscious use of symmetry, there is abundant evidence that the artists of more sophisticated epochs had a more or less complete knowledge of its principles. We know this is true because books upon the subject have survived. But we could establish the point from the design products themselves.

When the effort was made to fix the types of symmetry

found in design it was discovered that it was necessary to look into the matter of natural symmetry first. Here it was seen that there were two distinct types, one of which is exemplified by the crystal or regular natural pattern forms, and the other by the plant or the shell. The crystal type was called static, as previously stated, and the plant and shell kind were given the name "dynamic." When the design efforts of man were reduced to the symmetry basis

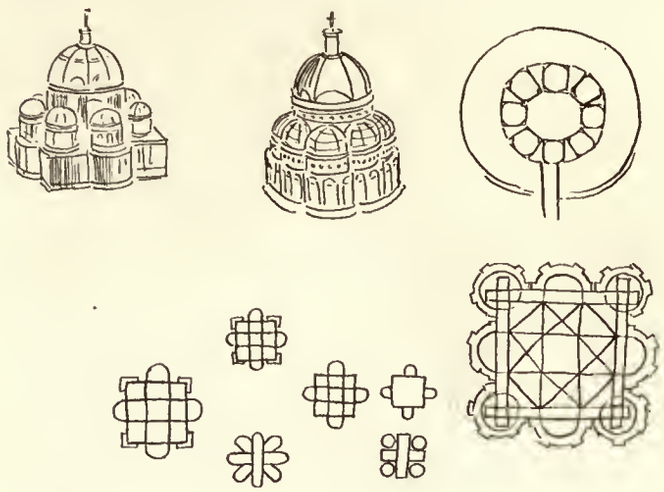


Figure 2.

it was seen that there was a parallel between the natural and the human product, that is, man as well as nature used either static or dynamic symmetry.

The static is the symmetry which is used intentionally or unintentionally. The symmetry used in Gothic, Byzantine, Saracenic, Moorish Mohammedan, Indian, Persian, Assyrian, Chinese, and Japanese design is intentional or conscious and static. That employed by the savage or the immature or decadent designer is unconscious or unintentional, and is always static.

Dynamic symmetry cannot be used unconsciously. It is the symmetry of Greek design during the great classic period.

A page from a note-book of Leonardo da Vinci, Figure 2, exhibits that great artist's conception of symmetry. On this page we have free-hand renderings of architectural ground plans and elevations. Like that employed by Michelangelo, this symmetry is static.

One of the leading Gothic architects of France was Villard de Honnecourt, who lived during the thirteenth century. He was the supposed architect of the Cathedral at Cambray, destroyed during the French Revolution. Villard once received a commission to build a cathedral in far Hungary and, while journeying to that country, made notes on the interesting examples of architecture which he saw. Fortunately his observations have survived in his note-books. It is particularly interesting that he made a sketch of the Cathedral at Laon, which he said was one of the handsomest buildings he had ever seen. We look in vain however in this sketch for a realistic representation of the cathedral such as a modern architect would make. The Gothic master simply made a rendering of the symmetry theme of the building, and, as later did Leonardo da Vinci, he made it free-hand. Figure 3. This architect well knew that if he understood the symmetry theme he could at any time and to any extent reconstruct the original. But Villard goes farther than architectural plans and elevations. He shows us how his static symmetry was used to establish the structural part of pictures and statues, and does not even disdain the minor illustration as the accompanying examples will show.

As has been said, we to-day are weak in our design where the masters of the past were strong, so weak, indeed, that some of our more thoughtful authorities have become alarmed and dismayed over the hopelessness of our outlook. But should we despair? I think not. I feel that we have been passing through a sort of hibernating or torpid period which is about to end. We are technically proficient in almost all departments of art and craft—perhaps as proficient as were the men of any period of design history. We are, or could readily become, masters of detail, and if we could once grasp the fact that the prime element in design creation is symmetry we could become masters of the ensemble, masters of assembling or putting together units of form to produce work of enduring character. In my opinion the first step toward the acquisition of this power of ordering design will be taken when we change our method of design measurement.

We make design measurement by line or modulus and produce automatically thereby an inferior type of symmetry. The great design of the past was measured by area.

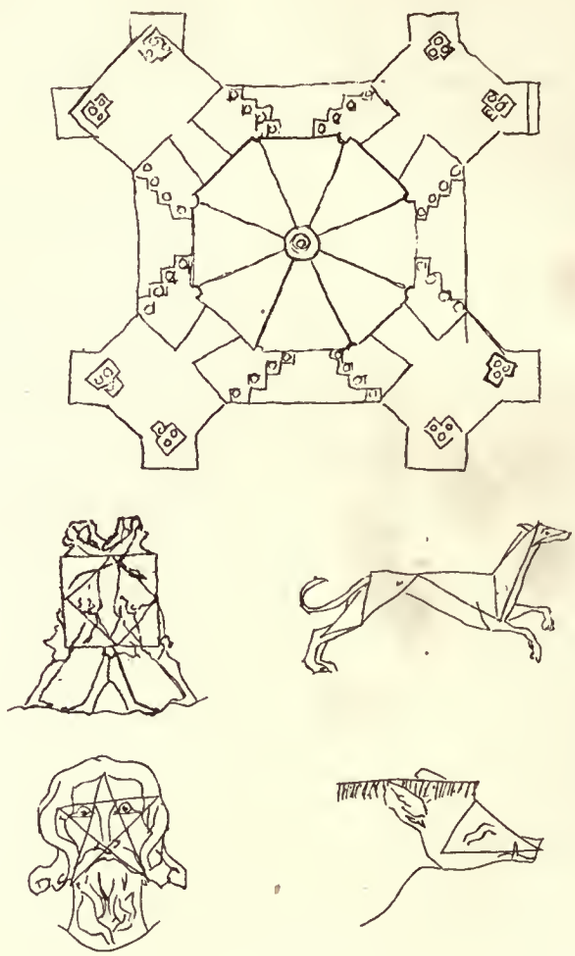


Figure 3.

When the area of a design has been determined by a unit of length or a modulus, this area is bounded by lines which are commensurable one with the other. That is, one line can be divided into another and the resulting ratio can be expressed by a whole number or a whole number and some even fractional part.

If the area of a design has been fixed by the regular figures of geometry and the subdivisions determined by

logical subdivisions of these figures the result may or may not be commensurability. Either of these methods produce static symmetry and of the two the latter is superior to the former.

When we analyze a dynamic design we find that the bounding or enclosing as well as the subdividing lines are incommensurable, that is, that they cannot be divided one into the other without producing a never-ending fraction. The only exception to this is when some unit or even multiples of a unit is divided dynamically.

As a general illustration, suppose we take a design which has been worked out on an area say 2¼ by 4½. No matter what unit of length was used by the artist in fixing this area the ratio, obtained by dividing the smaller number into the larger, will always be 2, that is 2 squares. This area will remain permanently static unless we subdivide it dynamically, but to do this we must depart from line measurement and substitute that of area.

This incommensurableness or unmeasurableness of line is characteristic of the dynamic type of symmetry. Dynamic forms are measurable however as areas.

If we take a square and use one side as an end and a diagonal as a side of an area this will be a dynamic shape of a low order. If we take two squares, place them side by side and construct a rectangle the end of which is equal to a side of one of the squares and the side equal to a diagonal to the two squares the result will be a dynamic shape of the highest order.

For example: The area *a* of Figure 4 is a square and *A.B.* is a diagonal. With this data we make the area *c*. The line *D.F.* of the area *c* is equal to *A.C.* of *a* and *D.E.* is likewise equal to *A.B.*

The area *b* is composed of two squares and *G.H.* is a diagonal to this shape.

The line *J.L.* of the area *d* is equal to *G.I.* of *b* and *J.K.* is likewise equal to *G.H.*

The area *c* is a root-two rectangle, a minor shape of the dynamic group of rectangles. It is so called because a square constructed on *D.E.* has twice the area of a square constructed on *D.F.*, that is *D.E.* is a root-two line.

The area *d* is a root-five retangle, the basic shape of the highest type of the dynamic series. A square on *J.K.* is five times the area of a square constructed on *J.L.*

The area *F.N.* is equal to the square *A.B.* and the excess area *N.O.* is the amount that the root-two rectangle *c* is greater than the square *a*.

The area *L.M.* is equal to the two squares *G.H.* and *M.P.* is the amount that the root-five rectangle *d* is greater than the two squares *G.H.*

The artist is not interested in this fact, nor need he know anything of mathematics when he uses these remarkable shapes constructively or synthetically. He may perform all the operations necessary with a string held in the two hands. But if he is compelled to analyze symmetry and to search for clues on a cold trail, then he ought to be well equipped to inspect data from different angles.

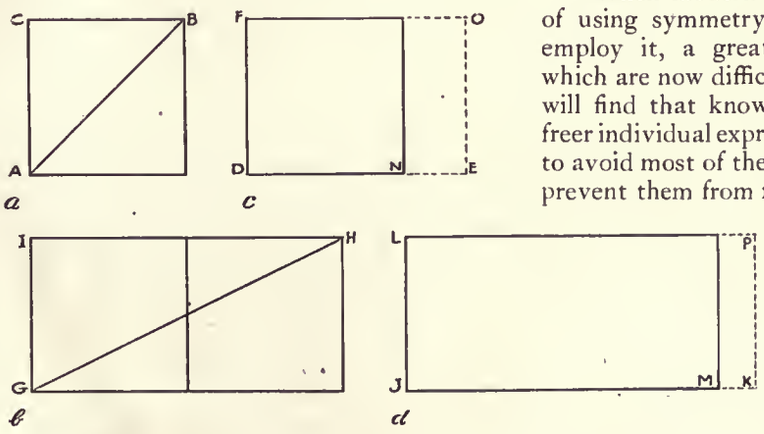


Figure 4.

An alert designer, however, will not be content to proceed blindly with his work. He will use every available means to increase his knowledge. To help this type of man, I have worked out a simple arithmetical scheme which will enable him to go into the subject as thoroughly as he may desire.

Abundant examples of early Greek design have been found where designers have changed their method of fixing symmetry rhythm by static means to the dynamic base. We have examples of this character where the artist has changed his procedure from the static scheme of squares and multiples of these to one of the root-two order, but nothing better than root two. Other examples show a change from the simplest static to the highest dynamic, of the root-five order. And in every such case the dynamic product is superior to the static.

Let us imagine a door the width of which is a side of a square and the length a diagonal to that square, if we understand the method or methods of making a logical division of such an area, we will be able to place panelling, ornament, door-knob, keyhole, and hinges in a manner somewhat like the development of the static plan by Michelangelo in Figure 1. That is, if we left the construction lines upon this area, as Michelangelo did, the result would not be dissimilar except in the type of symmetry. If we compared the Michelangelo static area with the dynamic area of the door we would find that the door possessed an element of proportion much more refined and elegant than is possible to obtain from a square by static subdivisions.

If the door we have described belonged to a building which had been planned dynamically it would have its logical position in the general design theme as does a panel in the theme of the door. This is precisely what the Greeks did in planning their temples except they used an area fixed by a side of a square and a diagonal of two such squares as a symmetry base.

When modern artists realize the necessity of using symmetry they will find, when they employ it, a great simplification of problems which are now difficult and embarrassing. They will find that knowledge of symmetry will give freer individual expression, that it will enable them to avoid most of the mechanical difficulties which prevent them from realizing their design dreams, that it will enable them to put into their creations the character which is its due. Symmetry will enable the artist to really develop new and fresh forms, will release him from the contemptible practice of pilfering other men's ideas.

One of the most interesting and instructive lectures recently given before the Architectural Club of New Haven, Connecticut, was that delivered by Professor Sheppard Stevens, of the Architectural Department of the Yale School of Fine Arts, on a "Vacation Tour Through Italy." The lecture was illustrated by beautiful stereopticon views and showed the most important churches, palaces, and other buildings, as well as the ancient architecture of Rome and early examples of Florentine architecture in the lovely city of Florence. Professor Stevens, who gave the architects a similar lecture on Architecture of India, pointed out many details which traced the history of the different schools of architecture met with in Europe and spoke of the ease and comfort with which travelling could be made through Italy at the present time.

Construction of the Small House

By H. Vandervoort Walsh
Instructor in Architecture, Columbia University

ARTICLE XIII

LESSONS TAUGHT BY DEPRECIATION

WHAT happens to the small house after it has been built? This is a question which should interest both the architect and builder, because from the answer can be had some very important lessons in construction.

To know where the weather, mechanical wear and tear, fire and water, begin the decay of the house is to know where to specify materials which will give the greatest durability to the whole.

This decay is called the natural depreciation of the house, but it is the architect's duty to make this as insignificant as possible. It is essential to study the local conditions under which the house will have to stand. At the edge of the seashore, where the damp and salty winds are prevalent, one would be foolish to specify metal for screens, gutters, valleys, and leaders, which tended to go to pieces by corrosion. But in a dry locality, the specifying of, say, galvanized iron for these parts would save money on the initial cost, and might not cause too great depreciation.

Likewise, the choice of the general materials of which the house is built should be influenced by the experience of the neighborhood. A wooden house in a seashore resort requires painting very often, and perhaps a brick house would in the end be more economical. A wood shingle roof on a house, tucked away under the dense trees of a lake shore, would have a very short life, and the use of some more permanent material would justify the additional expense.

Indeed, on all hands, in every locality, we have lessons to learn concerning what happens to a house after it has been built, and how it might have been avoided. To stimulate the reader to observe more in this direction we will call attention to some of the most obvious ways in which a house depreciates.

Examine most houses which have stood for ten to twenty years and it will be found that the foundations in nearly every case have settled unevenly, to a greater or less extent. This may be due to unforeseen causes, such as the action of underground water, frost, and disintegration of mortar, but generally it is the result of foundations built by the rule of the thumb. A wooden house seems so light that the average builder never bothers to consider the footings nor the loadings on them. Many walls are built without any footings at all, even though part of them rest on stone and other parts on earth. Now, of course, nothing serious as a rule comes of this slightly uneven settlement, but, add it to other things, and the depreciation of the property goes on rapidly.

As an example of this, one house might be mentioned which was greatly marred by the settling of the footings under the porch columns. These columns supported the second floor, which projected over the porch. The amount of settlement was only about two inches, but this caused the windows to lose their rectangular shape, making the operation of the sash impossible, destroyed the drainage direction of the gutters, necessitating the relocation of the leaders and the repitching of the gutters, opened up the crack between the floor and the baseboard, and made a large crack in the plaster wall and ceiling. The cause of it all was the building of the porch column footings upon filled-in earth, while the foundations of the rest of the house were upon rock. Uneven settlement was sure to take place under such conditions.

This same damaging effect of settlement is often noticeable in wooden frame houses, which have not been properly constructed to avoid uneven distribution of cross-section wood in the walls and partitions. Wherever there is a difference of cross-section of wood in two walls which support the same beams, there is sure to be uneven settling. The wall which has the greatest number of linear inches vertically of horizontally laid timbers will settle the most. This will cause sagging floors, sprung door-frames, and open joints.

Many cracked stucco walls on the exterior have been caused by too much cross-section wood in their framing. A balloon-framed wall makes the best backing for an outside wall of stucco, because the studs extend from sill to plate without any horizontal timbers intervening.

But it can always be predicted that the masonry walls and parts of the house will settle before the wooden walls and partitions. The chimney will settle more rapidly than the surrounding partitions of wood, and should, for this reason alone, be built entirely independent of any other part of the structure. Where the wooden-framed wall butts into a chimney, and the plaster is continuous over the brick of the chimney and the studs of the wall, there is sure to develop a crack at the joint because of the unequal settlement, unless the plaster is reinforced at this point with metal lath. Likewise, it is bad to support any part of the wooden floor upon a girder which bears upon the chimney, not only on account of the excessive sinking of the chimney, but the subsequent danger of fire which it creates.

A very bad method of constructing a chimney was imported from Europe, years ago, which develops serious fire dangers from its manner of settling. Instead of flashing and counterflashing the joint of the chimney with the roof, this method employed the use of a projecting course of brick begun at the level of the roof. Thus the part of the chimney above the shingle roof was made larger than that underneath, and the outward step was used as a weather lap over the roofing material, and no flashing was needed to make the joint tight. Now, when the chimney settled faster than the roof, as it would, the upper part could not drop, but was caught upon the roof, and lifted from the lower part. This made a crack through which the hot gases could escape to the attic timbers and start a fire.

On the other hand, wooden-framed walls will settle badly, too, when dry-rot sets into the sills. This is a very common defect in old houses, and generally, when any remodelling must be done, the sills have to be cut out and new ones set into place. Dry-rot in the sills is caused by excessive dampness with no circulation of air. Very often

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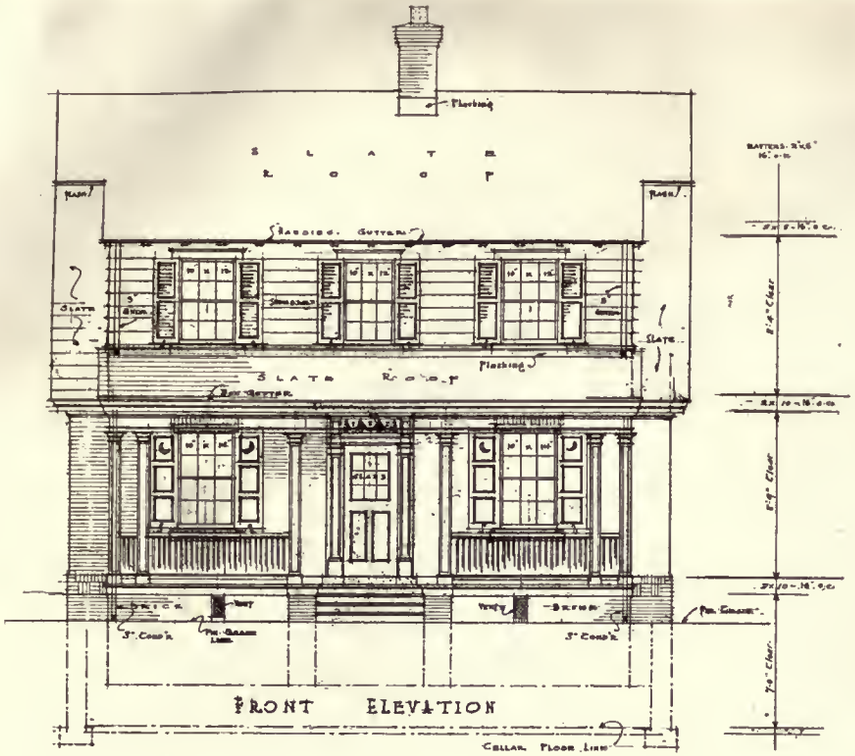
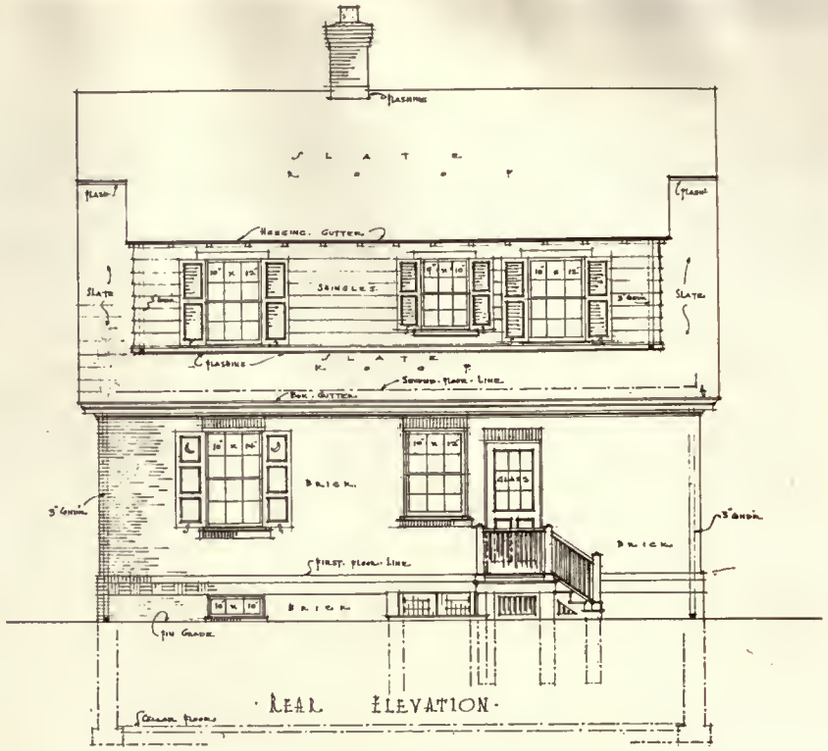
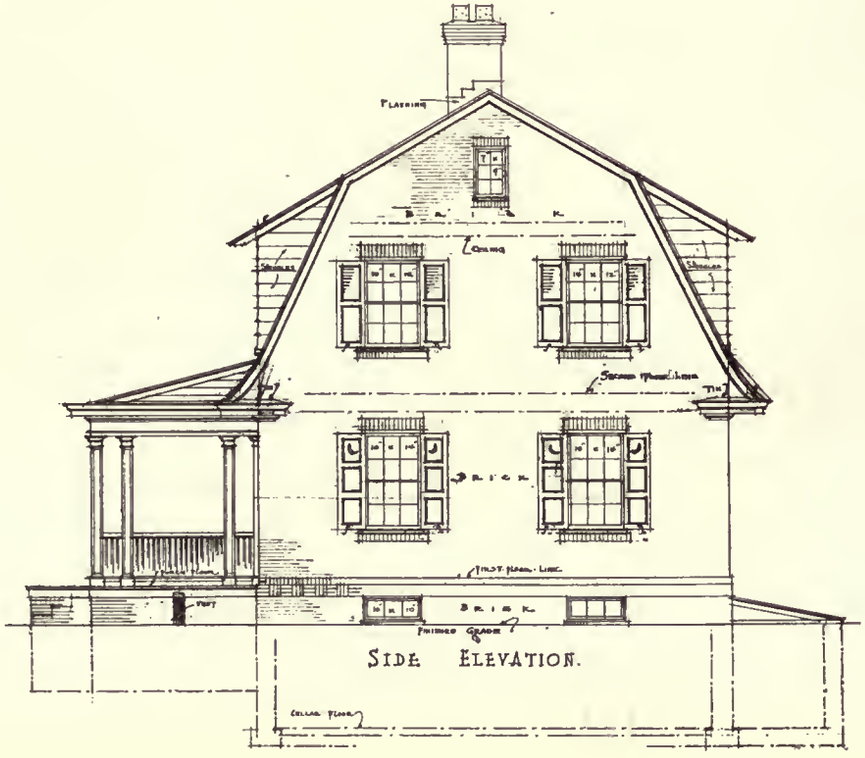
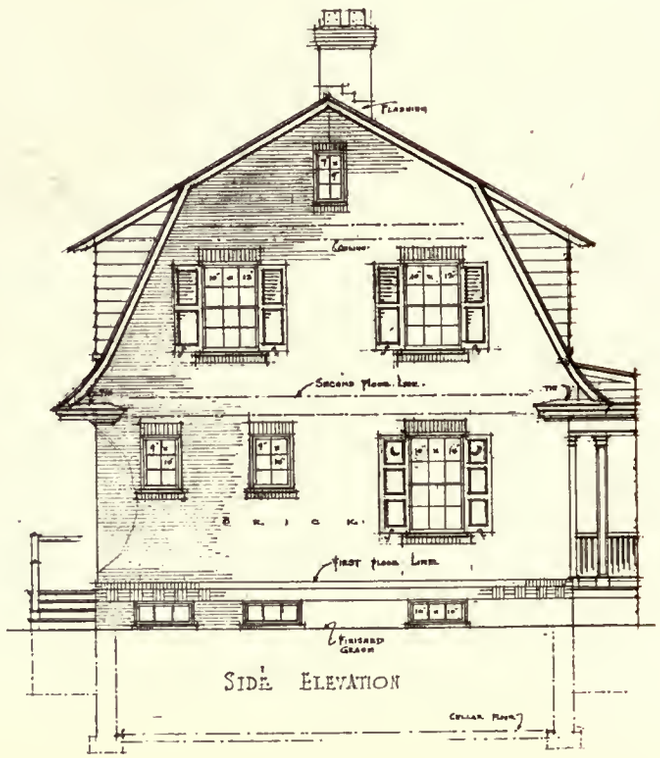


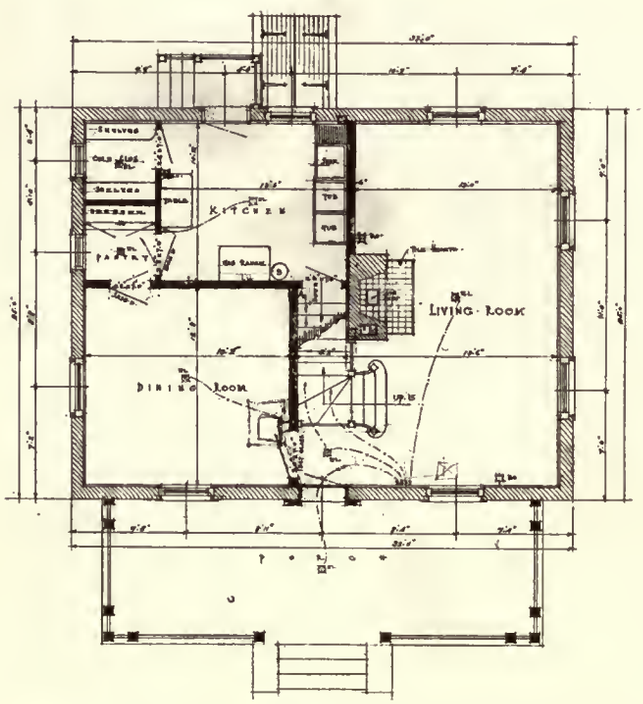


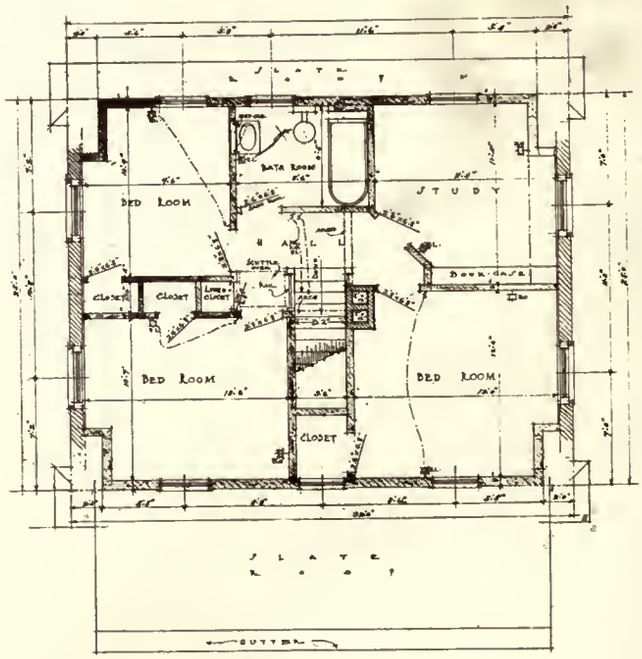




ELEVATIONS, RECTORY FOR ST. JAMES CHURCH, TRENTON, N. J.

Fowler, Seamon & Co., Architects.





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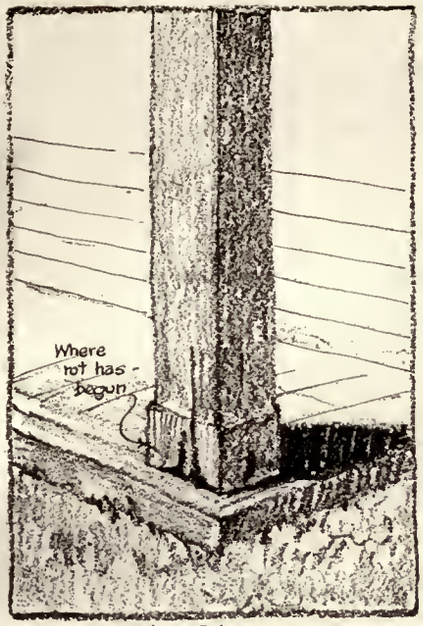
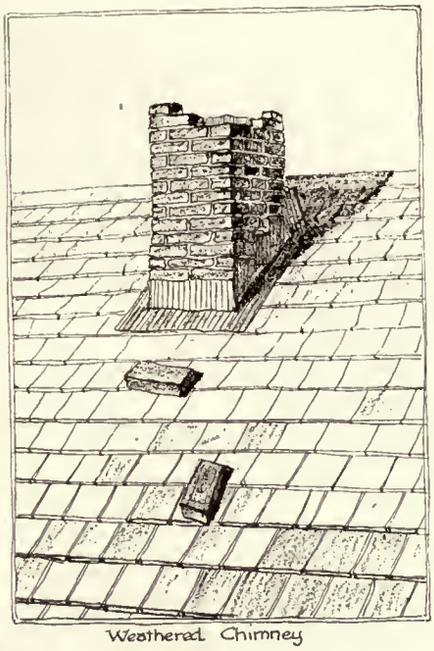
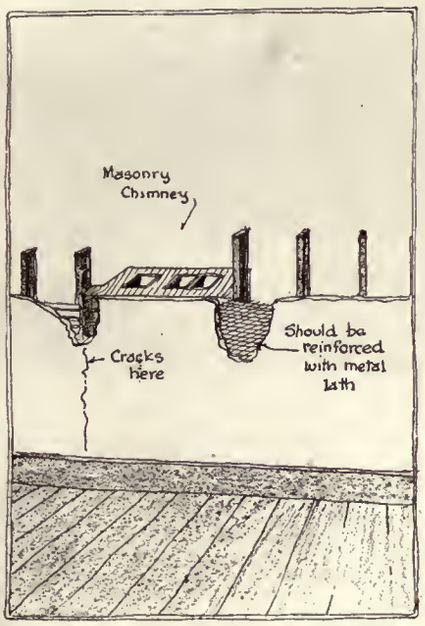
Fowler, Seamon & Co., Architects.

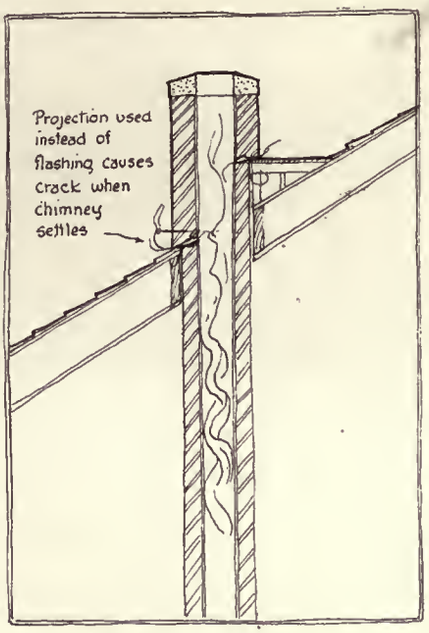


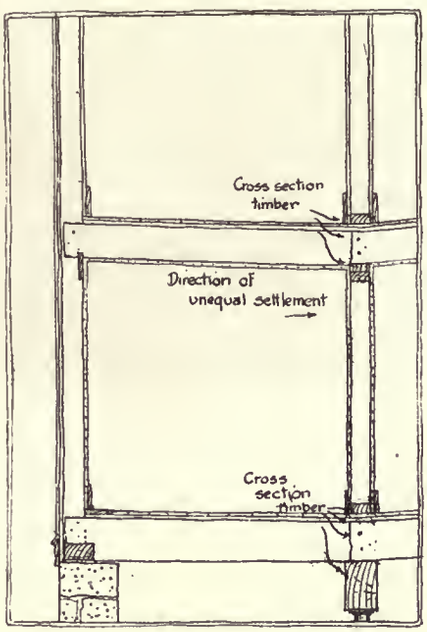
Solid Column

Uneven Settlement


Weathered Chimney







a builder may take great pains to fire-stop his walls around the sill, but forget to leave ventilation space, and the sill is soon attacked by the fungus of rot. Unless timbers which come in contact with masonry are treated with creosote, or painted, they will be subject to dry-rot in the average damp, warm climate.

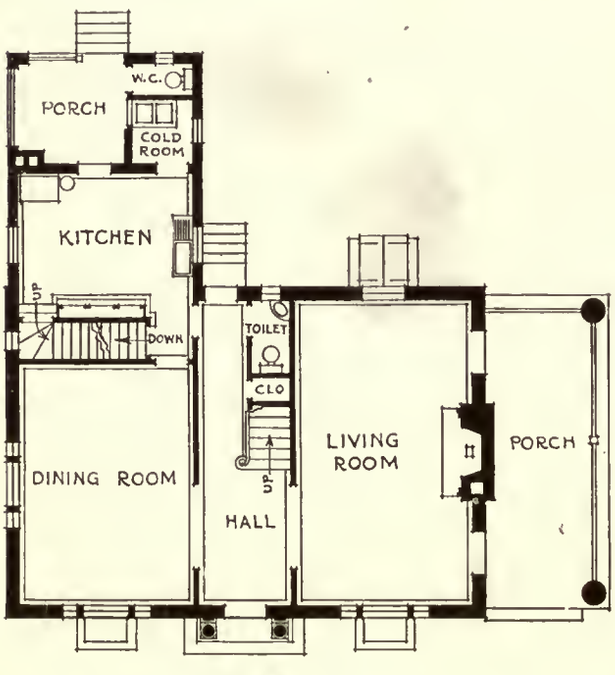
Many porch columns rot at their base and permit the settling of the roof. Solid columns are the least durable in this respect, for in a short time their core will go bad and the lower part will crumble. Wood base blocks for columns should be perforated with holes to permit the seepage of water under them. Cast-iron bases are preferred to the wooden one, when the column is to set upon a masonry porch floor.

Settling causes many other defects besides those mentioned. The house drain may be broken and the cellar flooded with sewage, if the wall around the pipe has been cemented up and it settles. The pitch of drain-pipes may be altered so much that back-up action of waste water may occur; steps may be caused to sag so that they become unsafe; lintels may be broken.

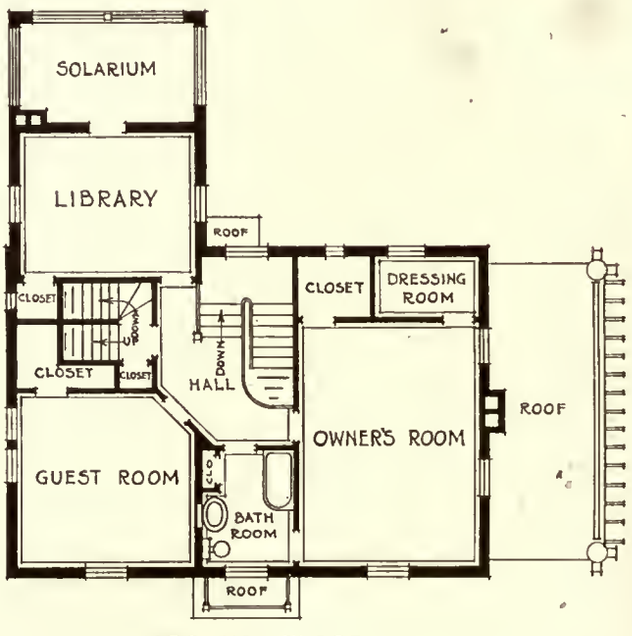
The movement of the footings by frost is another evil that is noticeable in many old houses. Sidewalks are cracked, porch stairs loosened, drains in areas closed. In most cases like this the footings are not extended far enough below the frost-line, or insufficient cinder foundations are laid.

But the action of freezing water leaves its marks on other parts of the house. Unless some corrugations in leaders are made, the ice in the winter may burst them. The mortar on copings is loosened by this action, and on chimney tops, where heat and gases also help, the brickwork soon breaks down. Many failures of stucco work are directly caused by frost, and sometimes water leaks into the cells of hollow terra-cotta blocks, freezes and bursts out the shell-like sides. The putty around the window is loosened by the drying action of the wind, and the prying action of the frost. Water-supply pipes in walls near the outside are

(*Continued on page 351*)



FIRST FLOOR



SECOND FLOOR

HOUSE AT POTTSVILLE, PA.

C. E. Schermerhorn & Watson K. Phillips, Architects.

(*Continued from page* 349)

broken when the cold winds freeze them, and the exposed gas-pipes in the chilly parts of the cellar are often entirely clogged in a severe winter. Leaks around windows in masonry walls are started by frost, and it is common to see tile on the porch floor or brick borders and bases loosened by the same powerful agent that breaks boulders from the mountainsides.

The heat of the sun is another destroyer of the house. It is death on paint, for it is forever baking it in the steam of the dew of the previous night, and when the body of linseed-oil is gone, the paint is no good. And it dries out the wood too much some days and spoils the jointing. It warps boards up and opens the mitred joints. It causes the wood shingles to crack and shrivel, so that when the next heavy rain comes the ceilings are stained by leaks. Tar for the roof and soft cements are caused to run out of place.

Then, too, there is the deteriorating influence of the artificial heat inside of the house. The fireplace tiles are baked loose from their mortar beds, cast-iron dampers are cracked, chimneys are clogged with soot and catch fire, and thimbles which receive the smoke-pipe of the furnace are broken. But the heat from the radiator does much damage. It blackens the ceiling above it by hurling little particles of dust up against it; it warps and twists the wall-paper; it misshapes the doors and windows, and breaks loose the strips of veneer, and it often spills water over the floor to ruin the ceilings below.

Added to all of the above depreciation is the natural wear and tear caused by the tenants. Floors are worn to splinters where they were of flat grain wood; thresholds are thinned down; stair tread scooped out. Plaster is broken by moving furniture, and decorations stained by accidents of all varieties. Hardware, like locks, hinges, and bolts, is broken.

Particularly is the mechanical equipment of the house subject to such deteriorating influences. Plumbing fixtures are broken, pipes are clogged, and joints made to leak through the corroding action of strong acids poured down the pipes. Radiator valves are turned out of adjustment, boilers are burned out, and hundreds of other things happen to this part of the house because of careless hands.

Thus we may say that the important factors of depreciation which an architect should keep in mind are unequal settlement, action of frost, washing-out effects of rain-water, corrosion, the heat of the sun, the artificial heat of the furnace, and the foolishness of tenants.

Unequal settlement can be prevented by carefully examining the construction, and the action of frost, heat, and sun can be minimized by the use of proper materials, and the foolishness of tenants can be partly offset by selecting those mechanical devices which are as near fool-proof as human hands can make them.

(*Continued from page* 342)

Hungerford Brass and Copper Co., 510 Arch Street, Philadelphia. Possession was taken by the Hungerford Company September 1, and they purpose carrying a full line of brass, copper, Tobin bronze, nickel silver, and monel metal products in Philadelphia, in sheets, rods, tubes, wire-nails, tacks, etc.

Philip Horton Smith, member of the firm of Kilham & Hopkins, architects, from 1914 to 1921, and Edgar T. P. Walker, of the office of Cram & Ferguson, architects, from 1910 to 1921, announce that they have formed a partnership for the general practice of architecture, under the firm name of Philip Horton Smith & Edgar T. P. Walker, architects, with office headquarters at 1260 Little Building, 80 Boylston Street, Boston, Mass.; Mr. Smith, 42 Chestnut Street, Salem; Mr. Walker, East Street, Hingham. Samples and catalogues requested.

Arden Gallery.—On October 31 Arden Gallery, Scribner Building, 48th Street and Fifth Avenue, will open its season with the Twenty-third Annual Exhibition of the American Society of Miniature Painters, which promises to be of unusual quality, and to the miniatures will be added as a special feature the display of a delightful group of Swedish porcelains made at the Rostrand factory in Stockholm and designed by Mrs. George Oakley Totten, Jr. (Vicken Van Post), the distinguished Swedish sculptor. These figurines are modelled with much greater art than those of the Dresden and Vienna ware. Mrs. Totten's creations are fascinating in their variety of subject and fanciful beauty. Not only is the modelling accomplished but her feeling for line and color is both original and charming. The selected examples gathered in Arden Gallery we believe have not been equalled since the period of the Tanagra figurines with which we are all familiar. A series of table decorations arranged by Arden Studios with the co-operation of several well-known artists will also be shown in this exhibition. There will be no private view, but the gallery will be open to the press on the morning of October 31 before the public opening in the afternoon.

Heating with Fuel Oil.—Ordinary fuel oil is the cleanest, most convenient, and most satisfactory form of fuel for heating, now that a simple, practical, and durable machine has been perfected for burning it, without noise, odor, or dirt.

The market price of fuel oil up to this time has remained around five cents per gallon. But even at ten cents per gallon, heating with fuel oil will be found a much more desirable proposition and no more costly than the old method of heating with coal.

For instance, one of the smaller-sized Hardinge oil-burning machines, Hardinge Brothers, Inc., Chicago (capable of heating the average ten-room residence), can be turned down so low that its fire will consume not more than one-half gallon of fuel oil per hour. On a mild winter's day when the fire is turned low it would require only about twelve gallons of oil for twenty-four hours' heating. At four cents per gallon this would be less than fifty cents for fuel for heating the home one whole day and one whole night.

On the other hand, when a large, hot fire is needed it can be had instantly and as simply as turning on the electric lights. It takes only two or three minutes to light the fire when the boiler is equipped with a Hardinge oil-burning machine, and the fire is hot as soon as it is lighted. Therefore, the fire can be completely extinguished without any of the previous dread of rebuilding same.

Jones & Roessle, architects, announce the removal of their architectural offices from 1025 Maison Blanche Building to Suite 817 Maison Blanche Building, New Orleans.

Walter Pleuthner, architect, has removed his offices to 132 East 40th Street, at Lexington Avenue, New York City. Material and catalogues, of late issue, of interest to architects, decorative architects, and landscape architects are requested.

Allen & Collens, architects, Boston, Mass., have moved their offices from 40 Central Street to 75 Newbury Street.

Concrete Construction

By DeWitt Clinton Pond, M.A.

EIGHTH ARTICLE

FOR much of the information required for the design of the first-floor beams and girders, which will be discussed in this article, the reader should refer to the first article. In this will be found a general description of the 395 Hudson Street Building and plans—both architectural and structural—of the portion of the first floor which is being designed. In the first article are given also the beam and girder schedule and the slab schedule, and the design of a typical beam and slab was investigated. It was found, however, that the design of the beams could not be definitely determined upon until the girders had been designed, and the girders could not be designed until the column sizes had been determined.

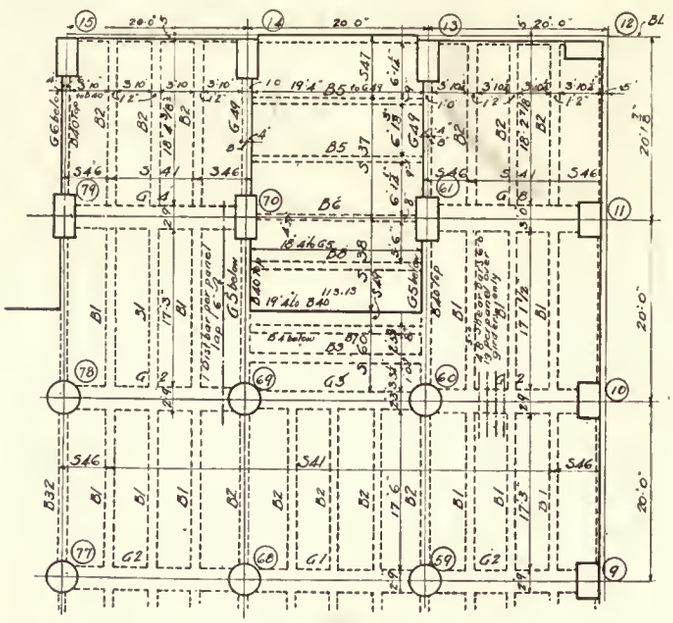


FIGURE II

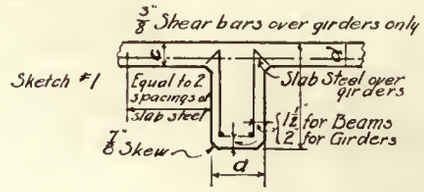
In the articles following the first the designs of columns and footings were discussed and it is now possible to complete the investigation of the beams and girders of the first floor.

If a typical girder can be found in the floor panels under consideration, such a one would be *G1* between columns 59 and 68. In general, it is necessary to determine the depth and width of such a girder in advance if possible in order to determine its weight. In the present case it will be safe to assume that the girder will be as deep as the architectural considerations will allow. The greatest allowable depth is 3 feet 8 inches, or 44 inches. Assuming a breadth of 2 feet 6 inches, or 30 inches, the area of the girder will be 1,320 square inches. It will weigh 1,320 pounds per foot of length. As the columns are 3 feet 2 inches in diameter, the clear span will be approximately 17 feet and the total weight of the girder can be found to be $17 \times 1{,}320 = 22{,}400$ pounds.

Slab Schedule

Mk	Total No Slabs	Slab Thickness	Steel Bars: Size and Spacing	Remarks	Near Col.
S 37	2	4½	½" ϕ Rods 8½ o.c.	1-⅜" Dist Bar per panel	14
S 38	2	4½	½" ϕ Bars 8½ o.c.	1-⅜" Dist. Bar per panel	70
S 41	18	5"	½" ϕ Rods 7½ o.c.	1-⅜" Dist. Bar per panel	59
S 46	10	5"	½" ϕ Rods 6 o.c.	1-⅜" Dist Bar per panel	9
S 47	1	4½	½" ϕ Rods 8½ o.c.	1-⅜" Dist. Bar per panel	13
S 60	2	4½	⅜" ϕ Bars 5" o.c.	1-⅜" Dist Bar per panel	

FIGURE IV



List of Beams & Girders

Mk	Total No	Size a	b	c	d	Square Steel D.B.	Str.	No. Layers	In Top	Stirrups Plain Steel	Sk. No.	Near Col.
B1	12	1'-2"	2'-6"	5"	5"	2-1⅜"	2-1⅜"	1		10-½" ϕ	1	60
B2	11	1'-2"	2'-6"	5"	5"	1-1⅜" 1-1¼"	2-1¼"	1		10-½" ϕ	1	59
B4	1	1'-1"	2'-6"	0	4½"	2-1¼"	3-1¼"	1	2-1"	14-⅜" □	14	60
B5	2	9"	2'-6"	4½"	4¾"	1-1¼"	2-1¼"	2		10 ⅜" □	1	13
B6	1	8"	2'-6"	4½"	4¾"	1-1¼"	2-1⅜"	2		10-⅜" □	1	61
B7	1	8"	1'-0"	4½"	9"		2-¾"	1		4 ⅜" □	13	60
B8	1	8"	2'-6"	4½"	4½"	1-1¼"	1-1⅜" 1-1¼"	2		10-⅜" □	1	61
B32	1	1'-0"	2'-6"	10½"	5"	1-1¼"	2-1¼"	1		10-⅜" □	1	77
B40	3	10"	1'-0"	0	5" 4½"		2-¾"	1		4-⅜" ϕ	24	60
G1	1	2'-9"	3'-8"	5"	5"	5-1¼"	5-1¼"	1		12-½" □	1	59
G2	4	2'-9"	3'-8"	5"	5"	6-1¼"	6-1¼"	1		12-½" □	1	59
G3	1	2'-3"	3'-2"	5"	4¼"	2-1¼" 2-1⅛"	3-1¼" 2-1⅛"	1		6-½" ▥ 6-⅜" ▥ ½"	1	60
G4	1	2'-9"	3'-8"	5"	5"	7-1¼" 1-1⅛"	7-1¼" 1-1⅛"	2		12-½" □	1	70
G5	2	1'-8"	3'-6"	4½"	0	3-1¼"	2-1¼" 2-1⅛"	1		20 ⅜" □	20	69
G6	1	1'-0"	3'-4"	4¾"	0	1-1¼" 1-1⅛" 3rd	2-1¼"	1		20 ⅜" □	15	70
G8	1	3'-0"	3'-8"	5"	5"	3-1¼"	10-½" 1-1⅛"	1		14-⅜" □ 6-⅜" □	1	61
G9	2	1'-0"	6'-10"	5"	4¾"		3-1⅛"	1		20-⅜" □	934	14

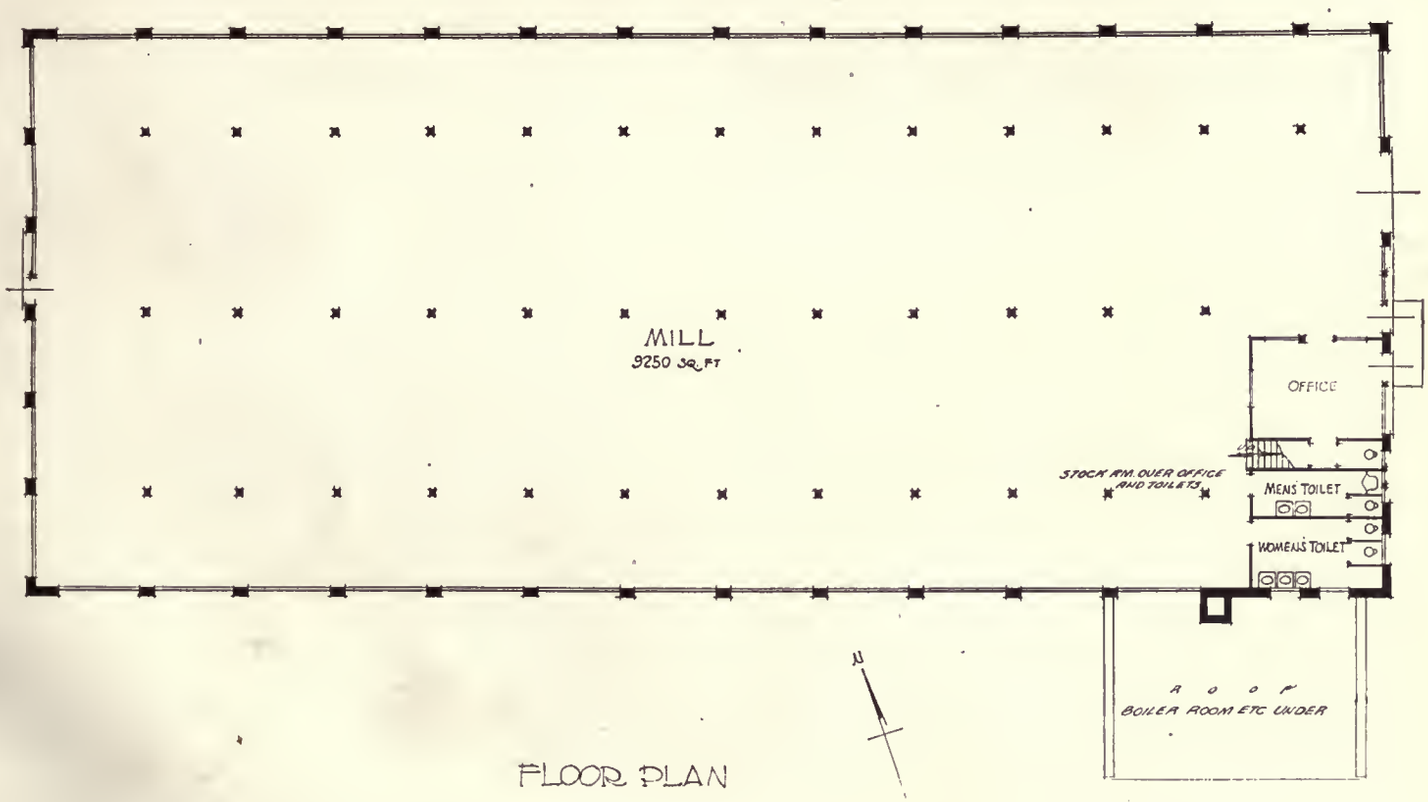
FIGURE III

There will be added to this the live load of the floor area directly over the girder. The girder being assumed to be 2½ feet wide, there will be 2,500 pounds load on each lineal foot and a total load of 42,500 pounds. The combined weight of girder and live load will be 64,900 pounds. It has already been determined that each beam will be loaded with 100,187 pounds, and as there are three beams between columns the total weight upon the girder will be $300{,}500 + 64{,}900 = 365{,}400$ pounds. One-half of this load would be 182,700 pounds, which will be taken tentatively as the shear. The width of the girder can be determined by dividing the shear by the effective depth multiplied by the allowable unit shear.

$$b = 182{,}700 \div (\tfrac{7}{8} \times 42 \times 150)$$
$$b = 33 \text{ inches, or 2 feet 9 inches.}$$

The condition of loading on the girder is shown in Fig. XX. The loads consist of three concentrated loads and a uniformly distributed load. The uniform load is considered as being larger than the one determined above, as the beam is increased in thickness from 2 feet 6 inches to 2

(*Continued on page 354*)



FLOOR PLAN

WEAVING-MILL FOR R. M. BURCH, TENAFLY, N. J. R. C. Hunter & Bro., Architects.

The large steel sash on all four sides with the small supporting piers give an abundance of daylight on the looms. The building is of mill construction, has a maple floor on sleepers over a concrete base, composition roof, steam-heating system, plumbing and electric light and power equipment. The machines are driven by individual motors. The cost of the completed building, built in 1916, was $13,777.

(*Continued from page 352*)

feet 9 inches. The reactions become 184,000 pounds each, and the upward moment due to one will be 184,000 × 10 = 1,840,000 foot-pounds. The downward moment due to the concentrated and uniform loads will be:

$$100{,}190 \times 5 = 500{,}950$$
$$33{,}800 \times 4.3 = 145{,}300$$
$$646{,}250$$

The total moment will equal 1,840,000 − 646,250 = 1,193,750 foot-pounds. The stress in the steel will equal:

$$S = \frac{1{,}193{,}750 \times 12 \times 2 \times 8}{3 \times 7 \times 42} = 260{,}000 \text{ pounds}$$

$$\frac{260{,}000}{16{,}000} = 16 \text{ square inches.}$$

The steel can be made up out of ten $1\frac{1}{4}$-inch square bars, of which five will be double-bent and five will be straight.

The next item to be considered is the design of the stirrups. It has been determined that the shear will be 150 pounds per square inch, as the breadth of the beam was determined on this basis. The calculations for the determination of the number and size of the stirrups are given below.

$\frac{1}{1}\frac{8}{0}$ × 17 = 12.45 feet, or 150 inches.
33 inches × 150 = 4,950 square inches.
4,950 × 55 = 272,250 pounds shear.
$\frac{1}{2}$-inch-square stirrups will have a value of 8,000 pounds per stirrup and there will be 34 required.
8 square inches of bent-up steel will have an effective area of 5.6 square inches, and will take the place of 11 stirrups at each end, or 22 stirrups at both ends.
There will be required 12 stirrups made up of $\frac{1}{2}$-inch square steel.

This completes the design of the typical girder. The next girder to be designed will be *G2* and the only difference between it and *G1* is that it is a semi-continuous girder, and the moment is six-fifths greater than the one used above. If there were 16 square inches of steel required for the continuous girder, there will be 19.2 square inches required for the one under consideration. The area can be made up of twelve $1\frac{1}{4}$ square bars, six will be double bent and six straight. The stirrups will be the same as determined for the continuous girder, as the shear remains the same.

G4 differs from both *G1* and *G2*, as the moment is the same as for a simple beam and will be the same as determined in the first calculation for *G1*, or 1,193,750 foot-pounds.

The stress in the steel can be determined in the usual manner from the moment.

$$S = \frac{1{,}193{,}750 \times 12 \times 8}{7 \times 42} = 390{,}000 \text{ pounds.}$$

$$\frac{390{,}000}{16{,}000} = 24.4 \text{ square inches.}$$

The steel can be made up of fourteen $1\frac{1}{4}$-inch square bars and two $1\frac{1}{8}$-inch square bars. One-half of these will be double-bent and the other half straight. The stirrups will be the same as determined above.

The area of steel required for *G4* could have been determined by multiplying the area required for *G2* by $\frac{5}{4}$.

G8 differs from the girders already designed as the span is less. The wall along which are columns 10, 11, and 12 is not at right angles with the wall along which are located columns 13, 14, and 15, and because of this the span between columns 61 and 11 is much less than between columns 9 and 59. The actual condition of loading is shown in Fig. XXI. It will be seen that the clear span is only 16 feet, but that the concentrated loads are nearer the right support than the left, and that the right reaction will be large enough to warrant the assumption that the total shear will be greater at this support than was the case at the supports of *G1*, *G2*, or *G4*. Because of this it will be safe to assume that the girder should be wider than those which have been designed.

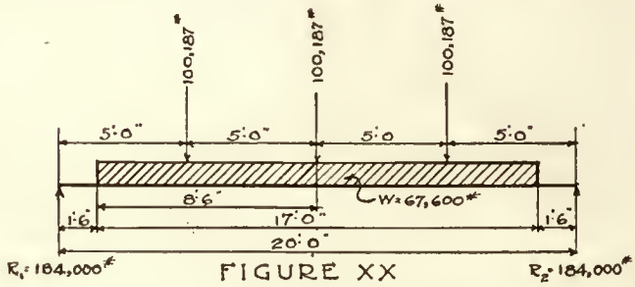


FIGURE XX

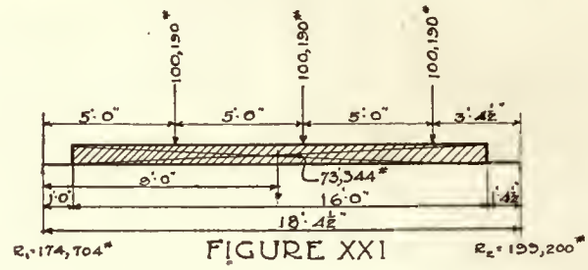


FIGURE XXI

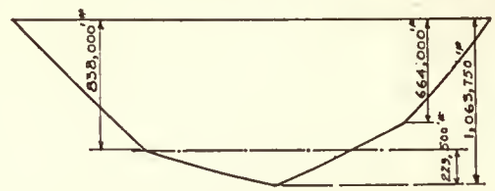


FIGURE XXII

It will be assumed that the girder should be 3 feet wide. The load per lineal foot of girder and live load will be:

$$44 \times 36 = 1{,}584$$
$$1{,}000 \times 3 = 3{,}000$$
$$4{,}584$$

The total uniform load for a clear span of 16 feet will be 4,584 × 16 = 73,344 pounds. The reactions are determined in the usual manner.

100,190 × 5 =	500,950
100,190 × 10 =	1,001,900
100,190 × 15 =	1,502,850
73,344 × 9 =	661,000
373,904	3,666,700

$$3{,}666{,}700 \div 18.38 = 199{,}200 = R_2$$
$$373{,}904 - 199{,}200 = 174{,}704 = R_1$$

In order to check the breadth or thickness of the girder it will be necessary to use the formula given above to determine the thickness of *G1*.

$$b = 199{,}200 \div (\tfrac{7}{8} \times 42 \times 150)$$
$$b = 36 \text{ inches, or 3 feet.}$$

This result is in accordance with the assumption already made, and it will not be necessary to reconsider any of the calculations given above.

(*Continued on page 357*)

Bloomfield Factory and Power-House

Wm. Wiegand, Architect
Consulting Engineers, Ph. Volz, O. S. Schlich

Entrance detail.

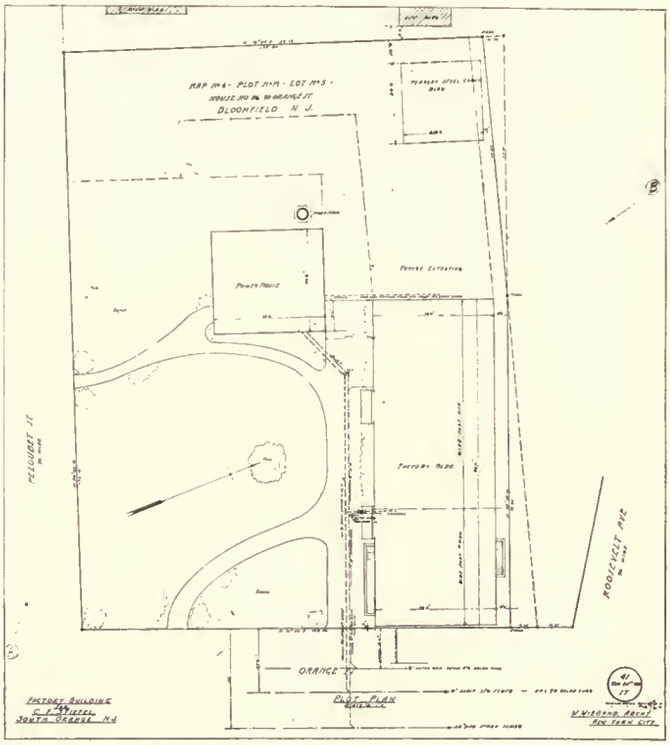
A SMALL layout of building groups constitutes part of modern development of city planning in the future.

In solving a problem from an economical as well as architectural point of view, and in special consideration of future extensions of buildings, this plan gives considerable aid.

Elimination of a monotonously long surface can be obtained by grouping the buildings as units.

By using a combination of materials, such as brick and concrete, a most pleasing architectural effect has been achieved, which may also be noted in the treatment of entrances and in the staircase.

The carrying structures, including the roof, were built of reinforced concrete, and the curtain walls plastered with a grayish stucco so as to harmonize with the natural concrete. No paint was used except on doors, door-frames, and window-sashes.



Plan, showing placing of future buildings.

The Power-house was treated similarly with exposed brick on inside walls, the roof being of reinforced concrete supported by continuous frames pivoted at the footings. The smoke-stack is self-supporting.

Staircase.

Showing construction.

Wm. Wiegand, Architect.

FACTORY AND POWER-HOUSE FOR C. F. STIEFEL, BLOOMFIELD, N. J.

FRONT (No. 1 ON PLAN).

SIDE (No. 2 ON PLAN).

Wm. Wiegand, Architect.

FACTORY AND POWER HOUSE, FOR C. F. STIEFEL, BLOOMFIELD, N. J.

(*Continued from page 354*)

The point of maximum moment will be found at the concentrated load in the centre of the span.

$$(174{,}700 \times 10) - (100{,}190 \times 5 + 4{,}584 \times 8.92 \times 4.46) = 1{,}747{,}000 - (500{,}950 + 182{,}300) = 1{,}063{,}750.$$

This moment of 1,063,750 foot-pounds is smaller than that found for the other girders, but this is due to the shorter span.

$$S = \frac{7 \times 42}{1{,}063{,}750 \times 12 \times 8} = 348{,}000 \text{ pounds},$$

$$\frac{348{,}000}{16{,}000} = 21.6 \text{ square inches}.$$

The combination of thirteen $1\frac{1}{4}$-inch square bars and one $1\frac{1}{8}$-inch square bar will be used to make up this area. Of the thirteen bars three will be bent and ten straight, and the smaller bar will be straight.

The question of shear is next to be settled. It has been determined that the unit shear is 150 pounds per square inch, the clear span is 16 feet, and the width of the girder is 36 inches, and therefore the number of square inches over which the shear is applied can be found by the following calculation:

$$\tfrac{1}{150} \times 16 \times 12 \times 36 = 5{,}070 \text{ square inches}.$$

The average shear is 55 pounds per square inch, and the total shear can be found to be $5{,}070 \times 55 = 278{,}800$ pounds.

If five-eighths of an inch square stirrups are used each stirrup will have a value of 12,600 pounds and there will be 22.3 stirrups needed in case the bent-up steel is not considered. In the case of a simple girder the point at which steel can be bent up and the amount of steel which can be so treated must be determined from the bending moment diagram. This diagram is shown in Fig. XXII.

The maximum moment has already been determined. The moments at the two critical points can be determined in the following manner:

$(174{,}704 \times 5) - (4{,}580 \times 3.92 \times 1.96) = 838{,}000$ foot-pounds.

$(199{,}200 \times 3.38) - (4{,}580 \times 2.08 \times 1.04) = 664{,}000$ foot-pounds.

It will be noticed that under the first load from the left support the bending moment is reduced 225,700 foot-pounds below the maximum. It might be possible to determine the amount of steel which it would be possible to bend up at this point, but it is more customary to first select the amount of steel which it is desirable to bend and then determine the point at which this can be done. In the present case it will be desirable to bend up three of the $1\frac{1}{4}$-inch bars, which will have an area of 4.69 square inches.

In order to determine the point at which this steel can be bent up it will be necessary to reverse the reasoning by which it was possible to find the required area of steel from the bending moment. Here we have the area of steel and it will be necessary to find the equivalent moment.

$$M = S \times \tfrac{7}{8} \times d.$$
$$M = 16{,}000 \times 4.69 \times \tfrac{7}{8} \times 42.$$
$$M = 2{,}754{,}000 \text{ inch-pounds}.$$
$$M = 229{,}500 \text{ foot-pounds}.$$

On the bending-moment diagram (Fig. XXII) a horizontal line is drawn through a point representing a moment of 229,500 foot-pounds less than the maximum. At the points where this line cuts the diagram the bars may be bent up, but it is customary to allow at least six inches in order to have the bars develop a proper bond.

An important consideration which must be borne in mind in connection with the bending up of steel in a simple beam is that a sufficient amount of steel must be kept straight to develop the proper bond between concrete and steel. The New York Building Code allows a bond stress of 80 pounds per square inch between concrete and the superficial area of steel in a plain bar, and 100 pounds per square inch between the concrete and steel in a deformed bar. In the present case all steel bars are deformed.

The method of determining the difference in tension in the steel between points one inch apart, at any place in the beam, consists of dividing the shear by the effective depth. Let U represent the difference in tension per inch of length, and V represent the shear at any point. Then:

$$U = \frac{jd.}{V}$$

An examination will show that difference in tension is slight near the point of maximum bending moment and is greatest at the supports or points of maximum shear. At the right reaction, in the present case, the shear equals 199,200 pounds. The difference in tension per unit of length —one inch—at this end can be found as follows:

$$U = \frac{199{,}200 \times 8}{7 \times 42} = 5{,}430 \text{ pounds}.$$

Now, $1\frac{1}{4}$-inch square bars have per each inch of length a superficial area of 5 square inches and, as the code allows 100 pounds per square inch, the bond stress per lineal inch will be 500 pounds. Ten bars will develop a total bond stress of 5,000 pounds.

An $1\frac{1}{8}$-inch square bar will develop 450 pounds as the allowable bond stress between concrete and steel in an inch of length, so that ten $1\frac{1}{4}$-inch and one $1\frac{1}{8}$-inch bars will develop a total of 5,450 pounds which is more than required.

This will make it possible to bend up three $1\frac{1}{4}$-inch bars as stated above.

Three $1\frac{1}{4}$-inch square bars will have a combined sectional area of 4.69 square inches. Seven-tenths of this will be 3.28 square inches, which will take the place of 4.2 stirrups at one end or 8.4 stirrups at both ends. This would leave 14 stirrups, which would be needed to withstand the shear.

Between the two outer concentrated loads it is well to place $\frac{3}{8}$-inch stirrups as shown. In this case six are called for, and the number is determined by the distance on centres, which is usually considered as one-half the depth of the beam. The distance between the two loads is 10 feet. The spacing on centres of the stirrups is 22 inches, which will give five spaces and six stirrups.

G3 differs from the girders already designed in that the beams are framed into it from one side only and that there is a uniform load only on the other side. The principle of its design is no different from that given in the cases of the other girders and it is suggested that the reader check this design.

This completes the determination of the dimensions and reinforcing of the girders on the upper tier, with the exception of *G49*, which is common to beams on the first-floor level and the beams on the wagon-court level. This girder and the beams of the wagon-court will be designed in the next article.

Artistic Building Is an Obligation

By Willis Polk

IN any structural problem, be it a bridge or a building, a warehouse or a cathedral, a given amount of labor and material may, for the same capital expenditure, be made to assume either agreeable or disagreeable form—the result may possess every element of economy and practical utility, but that great, elusive, ever-sought-after quality, artistic charm, may be totally missing!

Artistic treatment need not add to cost of construction nor detract from pure utility, therefore why not have it?

Every structural problem carries with it the obligation that it will not become an eyesore in a community.

Artistic result, being desirable, why do we not always get it?

The architect strives to combine beauty with economy and utility. Beauty is his beacon and in quest thereof, if successful, he has to overcome the obstacles of utility and economy.

Failure to achieve artistic results is therefore not always the fault of the architect.

The engineer, proverbially indifferent to all intangible elements, complacently relegates artistic effect to the realm of chance. He strongly resents the intrusion of the artist, and from his view-point the less artistic the result the greater his triumph. Utility, he argues, is beauty, and that is all there is to it.

Nevertheless, the artistic appearance of all structures, whether public or private, is an obligation which rests alike upon all in authority, whether he be architect, engineer, or owner.

Architecture is the art of creating an agreeable form.

In the days of Rameses artists had their problems, and art as well as artists languished.

In these days artists have their problems, and art as well as artists languish as usual.

In the course of time—yea, even until the end of time—I opine that art and artists will continue to languish, but that will not prevent the artist from striving. Such conditions, rather than deterring the artistic spirit, will only urge it on. Art is a domineering mistress, a mistress that never relents, and once one of her votaries falls under her thrall there is no hope but the hope of success at the expense of sacrifice, a hope that makes a votary renounce all other aims and forever cling to his mistress. Such an act of renunciation is a sacred sacrifice—one that is rarely commercialized.

We can always commercialize the old masters, we can always fatten and thrive on the prowess of a dead genius, we can always feel complacent over the hunger cravings of a living artist, and that without registering a single compunction of conscience, but notwithstanding that genius, though rare, is a constantly recurring manifestation of the divine spirit, we nearly always fail to recognize it in less than two hundred years. Living artists have no sales agents, no chambers of commerce, nor well-defined avenues of approach to the milk and honey of patronage—the halls of commercialized art are not open to them and will not be unless they die.

All that the living artist has is a mythological winged steed "Pegasus."

As Mr. Burnham said: "Make no little plans; they have not magic to stir men's blood and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency. Remember that our sons and grandsons are going to do things that would stagger us. Let your watchword be order and your beacon beauty."

ARCHITECTURE will begin in the December number an important and valuable series of articles on some of the great French designers and decorators. The articles already arranged for are: A Master Designer of Louis XV; Nicolas Pineou; Andre-Charlés Boulle; John François de Neufforge and Some Revelations of Domestic Architecture; Charles Cressent.

The author is Henry Coleman May, who has had special advantages due to long residence in France and Europe, and who brings to his subject a freshness of view and appreciation that makes his papers good reading as well as instructive. Each article will be illustrated with plates from contemporary books.

The Architectural Exhibit Under the Auspices of the Art Association of Montclair, New Jersey.—Beginning on November 21, with a private view and an address by George Clarke Cox, Ph.D., the Montclair Art Association will give an exhibit of architectural photographs, drawings, sculpture, interior decoration, and all other things which usually go to make up such an exhibit.

The arrangement of the exhibit is under the general charge of Mr. William E. Moran, architect (New York and Glen Ridge, New Jersey), who has secured the co-operation of prominent members of the architectural profession in New York and New Jersey.

A special feature of this exhibit will be a collection of the characteristic Dutch colonial houses of New Jersey.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

of ARCHITECTURE, published monthly at New York, N. Y., for October 1, 1921.

State of NEW YORK, County of NEW YORK

Before me, a NOTARY PUBLIC in and for the State and county aforesaid, personally appeared CARROLL B. MERRITT, who, having been duly sworn according to law, deposes and says that he is the BUSINESS MANAGER of ARCHITECTURE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

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CARROLL B. MERRITT, *Business Manager.*

Sworn to and subscribed before me this 21st day of September, 1921.

JOSEPH H. POLI
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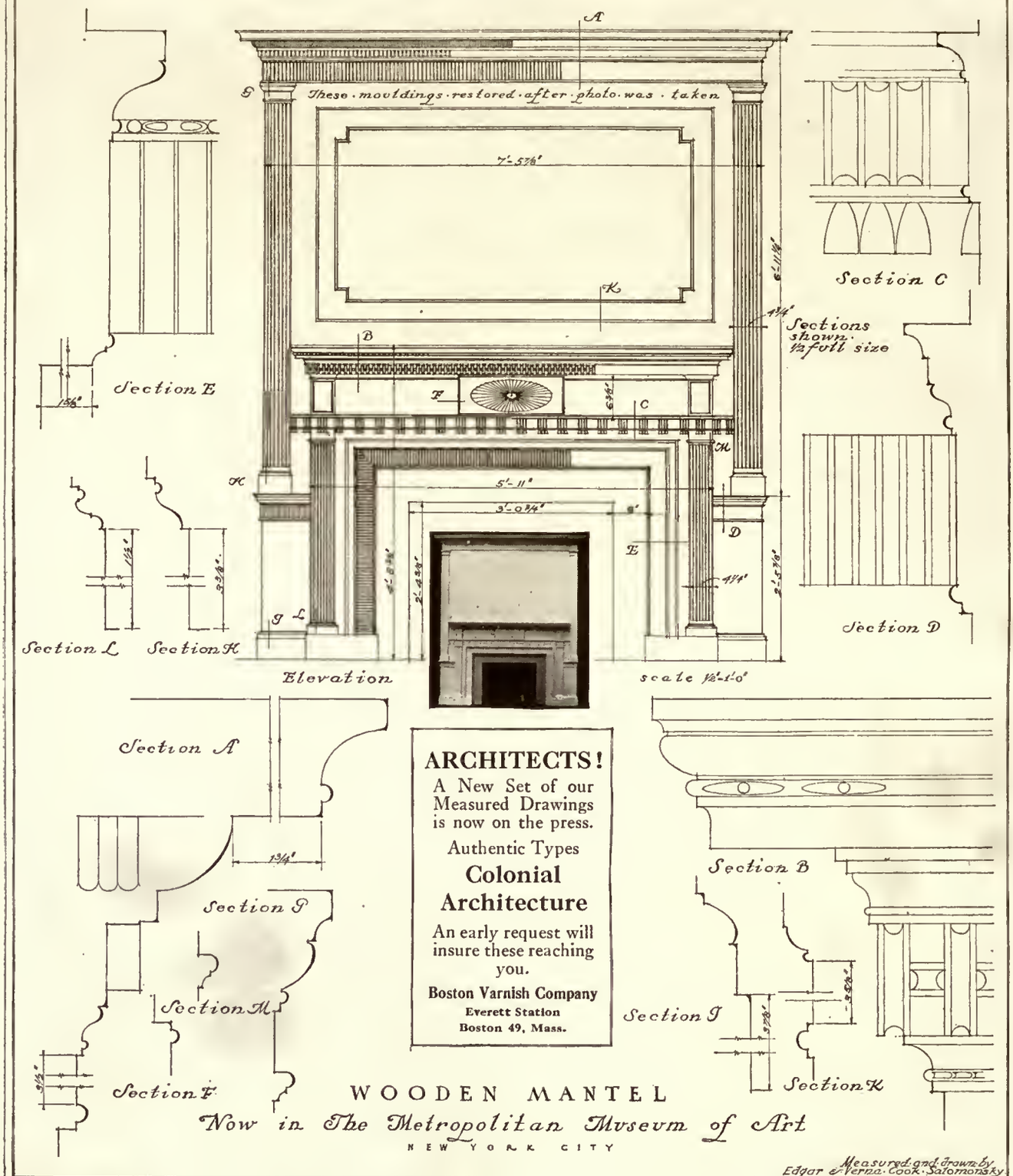

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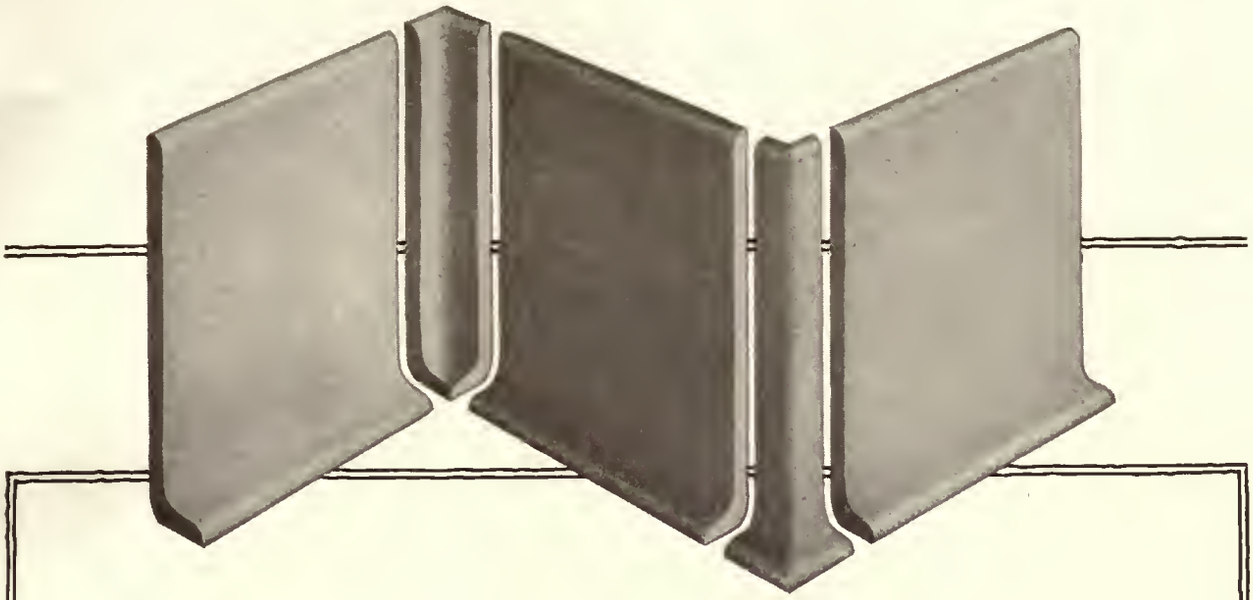

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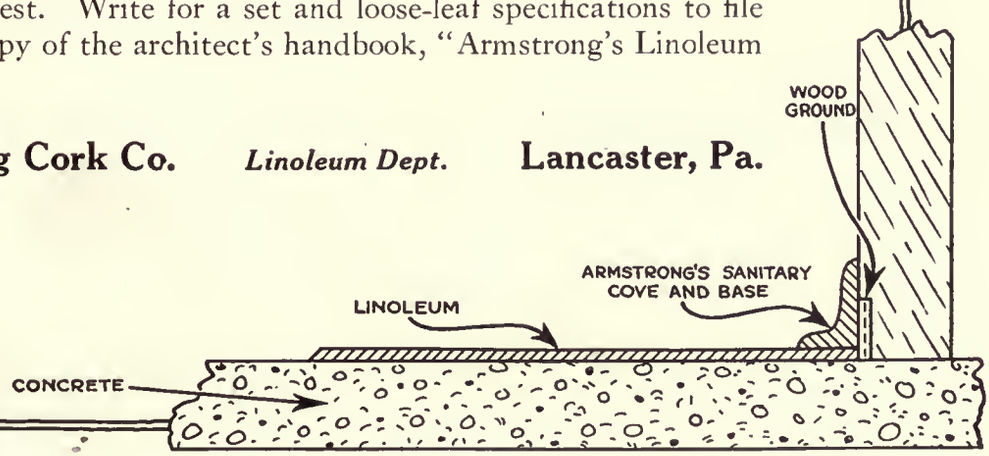

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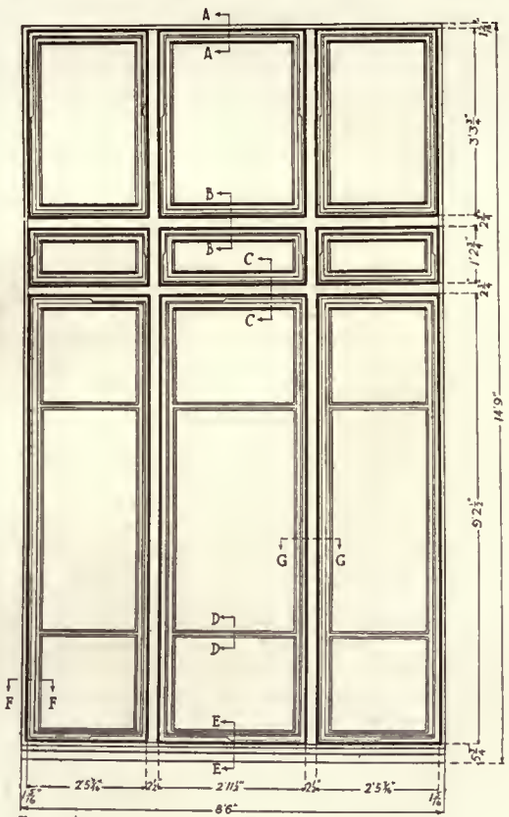

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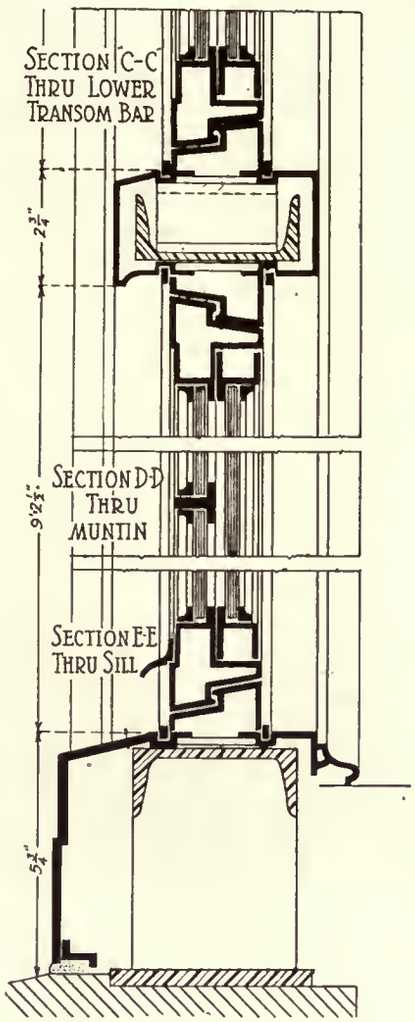

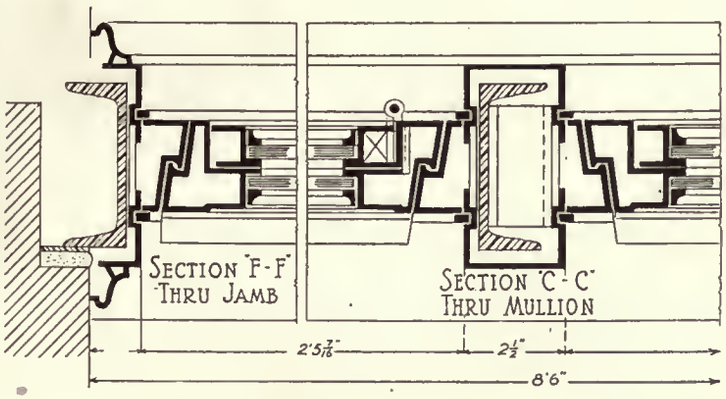

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Colonial Architecture of the Carolinas: Doorway, Judge Donald's Law Office, Newbern, N. C.	*Measured and Drawn by J. A. Altschuler*	Plate CLXXXII
Administration Building, The Globe Indemnity Co., Newark, N. J.	*Frank Goodwillie, Architect. Wesley S. Bessell, Associate.*	Plates CLXXXIII, CLXXXIV, CLXXXV, CLXXXVI, CLXXXVII, CLXXXVIII
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House, W. Laud Brown, Tenafly, N. J.	*R. C. Hunter & Bro., Architects*	Page 391

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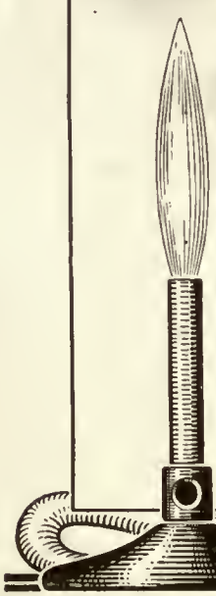

THE BUNSEN BURNER IDEA APPLIED TO BOILERS

GEORGE ROGERS CLARK MONUMENT, UNIVERSITY OF VIRGINIA. Robert Aitken, N. A., Sculptor. H. Van Buren Magonigle, Architect.

Awarded the Watrous Gold Medal for Sculpture, National Academy, 1921.

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A Master Designer of the Time of Louis XV, Nicolas Pineau

By Henry Coleman May

AFTER the masters of the Gothic era, there are in the history of architecture and decorative art none who have displayed a more fanciful and exquisite imagination than those artists of the eighteenth century, than those masters of interior decoration who flourished during the reign of Louis XV of France.

It is true that the draftsmen and artisans of fifteenth and sixteenth century Italy treated their rediscovered classic motifs with singular charm and originality. They translated antique forms into friezes and decorations which sought to be Greek or Roman but which, under the very personal touch of their creators, took on at once a wholly different aspect, a more gracile and voluptuous distinction than that which marked their severer and nobler prototypes. The copyists of the Renaissance were gifted with too much genius to merely copy. The original air was transposed by them, and masked by numerous variations. They transfused a new and genial essence, made of more delicate perceptions, into the antique designs which had served as their models.

I. Detail from the "Salle du Conseil" in the Palace of the Élysée. Nicolas Pineau.

Although full of a very vivid and distinctive originality, the art of the Renaissance was nevertheless, as its name denotes, a return to an already completely developed school. The absolutely distinct originality of the great Gothic days had passed. Those years of passionate Christian fervor when lace-like spires, aerial buttresses, and innumerable sculptured saints had been created with infinite patience and almost endless labor had closed. Those magical walled spaces, lighted through myriad-colored glass of almost incredible beauty, were all but forgotten as the pale columns of Roman temples arose from the astonished earth, and the marble limbs of Grecian goddesses were drawn forth from their deep hiding-places.

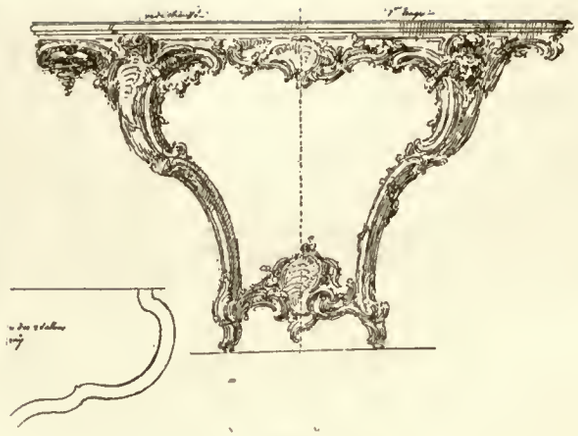
Classicism returned once more to its forgotten throne. The Greek orders, never again to be lost, had for all time come into their own.

Nevertheless, moments of reaction occurred punctuating, though never really interrupting, the sway of these rediscovered precepts. The seventeenth century, at a given moment, had almost obscured its classic constructions with a covering of baroque ornamentation, a disguise which at times nearly veiled its basic principles. In the succeeding century there followed another moment of rebellion against Greek forms, this time, though shorter in duration, more complete and successful than the attempt of earlier years. The change became apparent in the first decade of the eighteenth century when the popular taste began to demand and finally to insist on a new freedom of line, or curious graceful inequalities and amusing contradictions. This eccentric spirit led, of course, to innumerable exaggerations; to creations which sometimes even passed the boundaries of good taste.

The architects and minor draftsmen of the time of Louis XV had, many of them, become too deeply steeped in the redundance of Italian baroque decoration. Meissonier, that erratic genius, seemed to see all the world as a huge rococo composition, some vast exotic garden splendidly distorted by his rioting inventions. Oppenort, almost equally gifted though far saner, had returned to France with ineffaceable memories of Venetian splendors.

There were many others, however, who in that period of extremes managed to retain the essentially French taste for repression combined with that "verve" and "esprit" which can be found in no other country.

Foremost among these followers of a new phase of art was Nicolas Pineau, a designer who kept to a very marked degree an unshakable sense of line and proportion even in the most free and fanciful of his compositions. It is impossible to glance at his designs without at once realizing this fact. His drawings exemplify to its highest point the very best taste of the Rocaille School. No designs could more clearly convey to one the harmonious atmosphere of



II. Design for a console. Nicolas Pineau.

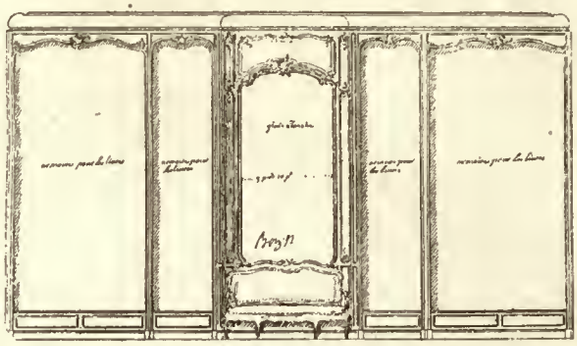
a cultivated and luxurious age, an age in which splendor had become tamed and had been brought up to its most affined possibilities. In Pineau's compositions we find all the originality of the Rocaille School tempered with an innate lightness of touch and a spontaneous sense of values.

Born in Paris in 1684, Nicolas Pineau was one of the most gifted artisans of the early years of the reign of Louis XV. In the first flush of his popularity he was sent for by Peter the Great, who commissioned him to design and supervise the building of the palaces at Peterhof, and of a summer residence on one of the islands in the neighborhood of Petrograd, now, unfortunately, no longer existing. He remained in Russia for eleven years, during this time making innumerable drawings not only for the imperial family but also for many members of the Russian nobility. His versatility and invention seem to have been endless, and his range of subject of the most varied description. Exteriors and interiors, both civil and religious, with every imaginable appurtenance and detail fully described, appear in his portfolios. Balconies, lamps, fountains, tombstones, consoles, cartouches, "porte-cochères," to say nothing of chimneypieces and complete designs for every kind of room and apartment. And with what spontaneity these designs are sketched; how facile and light is Pineau's pencil, how unerring his taste and how accurate his eye!

III. Three designs for sculptured and gilded wall panels. Nicolas Pineau.

It is true that one can hardly keep from smiling as one looks at his projects for churches, for altars and sacristies. These would seem to be merely backgrounds for the "abbés-galants" of the day; graceful travesties which are too charming to be considered sacrilegious, and which might find their place as scenery for an act of "Manon." These things are the fault of the epoch, hardly of the artist. Religion had almost arrived at the point of having to follow the fashion of the day before humanity, in the terrors of the Revolution, turned its eyes in repentance and awakening once more toward God.

The industrial arts of the time of Louis XV are oftentimes, outside of the land of their origin, recognized principally by their worst examples. To the average person the terms "rocaille" and "Louis-Quinze" are almost synonymous for excess of line and extravagance of ornament. To the connoisseur there is hardly another period comparable with the one in question in charm and artistic interest, in so far as its industrial and minor arts are concerned. In what other epoch could one find compositions more harmonious, more wholly pleasing than those of Nicolas Pineau! How easily, on glancing at his designs for wall panellings, one can imagine the spirited decorations of Pillement or Huet framed within those slightly waving mouldings; how well one can fancy the overdoors and "trumeaux" of a Boucher bordered by those arabesques and gently undulating lines! His chimneypieces seem to be waiting for a terra-cotta group by Marin, a marble of Falconnet, or a bust of some fragile court beauty by Pajou.



IV. Design for a library. Nicolas Pineau.

The too severe may perhaps characterize this entire style as futile and frivolous, but there is no real reason why these interiors should not be both of these things if one can ever consider consummate art futile. Such condemnation ceases to be criticism. In dealing with the epoch in ques-

V. Design for a library. Nicolas Pineau.

tion one may not be far from the truth in arriving at the conclusion that so-called frivolity is oftentimes but another name for a philosophy and a courage that are not to be despised. The eighteenth century had very little hypocrisy regarding its point of view, its moral attitude. La Rochefoucauld said truly that hypocrisy is the homage that vice renders to virtue. This being the case, one can but conclude

VI. Designs for church stalls and for archbishop's chair. Nicolas Pineau.

that the eighteenth century, frivolous, though not unthinking, above all pleasure-loving, was surely not a vicious age. It was primarily an era of good taste, and vice is rarely found within these bounds. A taste expressed is obviously the most tangible manifestation of one's way of thinking and feeling. Consequently, as one looks at the heirlooms of a departed generation one is forced to conclude that, after all, the much maligned society of the time of Louis XV was possessed of delicate sensibilities and an agreeable soul. If it did not sin as much as a former period its sins at least were infinitely more charming.

The consideration of these characteristics cannot but help one to properly appreciate the background against which moved the society of the time, polished and subtle, avid of impressions and sensations.

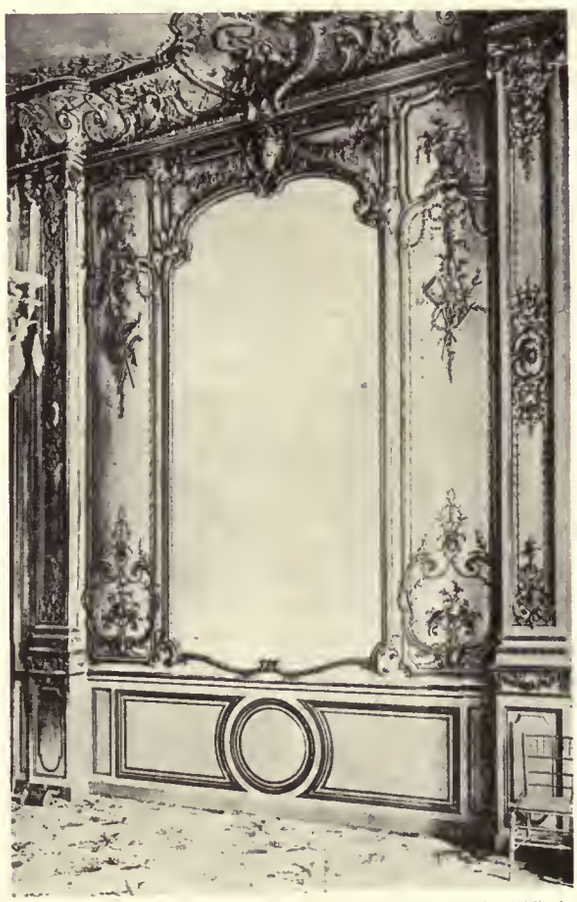
One cannot help feeling in all the art of the time of Louis XV the temper of the epoch. Pineau's interiors were composed in a spirit similar to that in which Fragonard conceived and executed his masterpiece, "L'Escarpolette." Here we have the same voluptuous sense of movement, the same occult balance in composition, the same freedom and perfection of taste of which the century of Watteau was alone capable of bringing to so fine a blossoming. How descriptive of the ethics of this period is the word-picture of her husband which the grandmother of George Sand gave to the authoress: "Your grandfather," she said, "was handsome, elegant, carefully attired, delicate, perfumed, active, lovable, tender, brave, and joyful until his death. In his time there seemed to be no repulsive bodily pain: one preferred to die at a ball or in the theatre rather than in one's bed among four wax-tapers and depressing, ugly people robed in black. We enjoyed life, and when the time came to leave it no one sought to deprive others of their pleasure in it. Indeed, the last farewell of my husband consisted in his bidding me to survive him long and to amuse myself."

Amuse themselves they most decidedly did. It must have been a joy in itself to be able to go from house to house, from château to château, in which everything was designed to please the eye; to live in the midst of surroundings in which the arts blossomed so splendidly. Many of the Parisian hotels owed their charm to the genius of Nicolas Pineau. A contemporary, speaking of the Hôtel de Mazarin, now demolished, which stood in the rue de Varenne, said: "Pineau is an artist to whom we shall always owe a debt of gratitude and of infinite admiration. The interior of the hotel of the Duchesse de Mazarin is the most agreeable which it is possible to imagine. In composition, in the elegance of the ornaments therein, it has never been surpassed, and its gayety and lightness is everywhere repeated and multiplied by the magic of mirrors."

Besides this particular house our artist was responsible for numerous decorations and details to be seen in the hotels Roquelaure and de Villeroi, in those of the Dukes of Luxembourg, Chatillon, and d'Harcourt, and of the Maréchal de Villars. He collaborated with Blondel in the building and decoration of the Hôtel de Rouillé. He designed the famous gallery in the château at Suresnes belonging to Louis de Montmorency, Prince d'Isenghien, and he elaborated another residence in the environs of Paris, at Asnières, for the Marquis le Voyer d'Argenson. He is supposed to have worked in the celebrated Hôtel de Conti, and the wall-panels in the "Salle du Conseil" in the Palace of the Elysée have been attributed to him.

Most of these houses and their decorations have, alas, disappeared. Time has spared but few of the works of Pineau, and were it not for the fact that his original drawings have been preserved with such remarkable and religious care, very little would have come down to us descriptive of his manner.

Even in Russia, where for eleven whole years he worked unceasingly, there is little left that is undeniably his. Of his work at Peterhof there are but few surviving traces. The panels in the Emperor's study are after his designs, as well as the consoles in the lacquered salon within the same



VII. Detail of a room from the Château de Bercy in the style of Nicolas Pineau.

palace. The extensive decorations which he planned by order of Peter the Great have all been destroyed, or were changed beyond recognition to meet the more exuberant taste of the Empress Catherine.

Nicolas Pineau died in Paris in 1754. He was succeeded by his son Dominique, with whom he had collaborated for many years before his death. There is little comparison between the talent of the two men. The son was not gifted with that spontaneity and facility so characteristic of the elder man's work. Dominique, during the remainder of his days, continued to design numerous interiors and their accessories. His compositions were popular and always in demand. His style was pronouncedly that of Louis XVI, and similar in conception to that of the celebrated architect Neufforge, under whose influence the son of Nicolas Pineau most probably fell.

Common Sense Applied to Concrete

By David B. Emerson

MUCH has been written on the subject of concrete, both pro and con. The cement companies have flooded the country with literature, holding up concrete to the public as the only material to be used for everything. Other interests have, on the other hand, circulated quite a little literature condemning concrete more or less heartily. One short-lived magazine was published in Chicago a few years ago in the interest of the burnt-clay products, whose only mission seemed to be to record the failure and collapse of concrete buildings.

Now between these two extremes there must be some logical middle ground, a common-sense basis for judging between the real worth of concrete and its fictitious and inflated value. In its proper sphere concrete is a most excellent material, and for many uses absolutely indispensable, and has no efficient substitute, and probably never will have. The great trouble is that it has been largely exploited as a panacea for all building ills, and, in consequence, it has been used unwisely and injudiciously, even going so far as to build concrete ships, which, if they were not a total failure, were a long way from being a howling success.

One of the greatest reasons for the popularity of the reinforced-concrete frame for buildings has been that it was so much cheaper than structural steel frames; in fact, almost the only claim made by conscientious engineers in favor of reinforced concrete over structural steel has been that concrete was so much cheaper, and the South and the West fell very hard for that claim.

Now the point is, is concrete so much cheaper after all? Where labor is very cheap the first cost is less, but when one figures up the speed with which a steel-framed building can be erected, and the greater length of time which is taken in erecting a concrete building, is it cheaper? Steel may be fabricated while the site is being cleared and the excavation is being done, so that when the footings are in the erection of the frame can be started at once. Whereas, on the other hand, with a concrete structure the forms cannot be set until the excavation is complete, so that the frame has to progress slowly, and on account of the great amount of form work which is in the way the brickwork cannot be laid up as quickly as with a steel frame. Considering these points, it is very easy to see that a steel-framed building can be completed from four to six weeks earlier than if the same building had been built with a concrete frame. By finishing a month or six weeks earlier, the owner has that much extra rental, which on a moderate-sized ten or twelve story office-building would probably amount to from eight to ten thousand dollars, which would go quite a distance toward offsetting any difference there might be between the cost of reinforced concrete and structural steel.

One of the most serious objections to reinforced-concrete frames in tall buildings is the enormous size of the columns in lower stories, which cuts down the available floor space not a little. The writer has actually seen concrete columns in the basement of a fourteen-story hotel which, after being incased with four inches of brickwork for decorative purposes, were 42 inches square, with an area of 12¼ square feet. The equivalent of this column in structural steel would have been a 14-inch Bethlehem H section, with 16 x 1¼-inch cover plates. After properly incasing the column with fireproofing, allowing a ¾-inch air-space between the steel and the fireproofing, and then incasing the column with four inches of decorative brickwork, it would have made a column 30 inches square, with an area of 6¼ square feet. This would make quite an addition to the available floor space in a rathskeller, where each additional table in busy times would mean extra money for the proprietors of the hotel.

Figure I shows the column as it was built, and Figure II shows the column as it could have been built if steel had been used instead of reinforced concrete.

By looking at Figure II it can readily be seen that there is a large open space between the flanges of the steel column in which pipes and conduit may be run, whereas with concrete-framed building it is always a serious problem where to run concealed pipes, as every one who has ever had anything to do with the designing of concrete-framed structures very well knows.

As another illustration of the waste room which results from the use of concrete columns, Figure III shows a wall column in a building which was recently erected in which there was a clear span of 38 feet between the walls. Figure IV shows the size of the column which would have been required had the same building been built with a steel frame instead of reinforced concrete.

Another and more serious objection to concrete frames in office-buildings, hotels, and similar buildings, and in the writer's opinion a most serious one, is the inability to get good and sufficient anchorage for projecting belt-courses and cornices. This can be readily seen by comparing Figures V and VI. Figure V shows a belt-course using a concrete frame, and Figure VI shows the same belt-course using a steel frame. The reader may readily see how much better the anchorage is using the steel frame than it is where the concrete frame is used.

Perhaps one of the most senseless of all the misuses to which concrete has ever been put is the building of trusses of reinforced concrete, using concrete for both tension and compression members. This can only be considered as a stunt, after all, and could have been done far better and easier with structural-steel shapes. All engineers who have worked much in reinforced-concrete design, when pinned down to facts, acknowledge that in all such work they add a large amount of extra steel to make up for any possible failure on the part of the concrete. Still, with all the misuse of concrete, as stated earlier in this article, there are many places where it is invaluable and the very best material known, and in these places it should be used in preference to any other structural material. The concrete pile cast in place is as near to perfection as we are likely to get. Its life is practically eternal, and in most cases, on account of the fact that, unlike wood piles, which must be kept always submerged in water, it is very economical because of the great saving in footings.

Of course it is needless to say that concrete is far and away the best material for footings for walls, piers, and columns. For certain structural uses reinforced concrete is far ahead of any other material, as in the construction of factory and warehouse buildings, built for purely utilitarian purposes, such as Ferguson in the introductory chapter of his "History of Architecture" classed as merely building, or as engineering, and not architecture. Buildings which are not carried so high as to make the columns unnecessarily large, and where the walls are carried frankly on the frame, and no attempt at decoration or concealment of the construction is made, are most ideal types for reinforced-concrete construction.

A building like that shown in Figure VI is an excellent example of the truthful and proper use of concrete, and the more of that class of buildings that are built the better. They reduce the fire hazard in industrial communities immensely, and also if a fire should get started in one section of a town, such buildings form a barrier and stop its spread. The first cost of such buildings is naturally somewhat higher than slow-burning or mill construction, but when one considers the saving in insurance rates and the difference in deterioration, they are cheaper in the long run, and the American public is slowly but surely waking up to the fact that it does not pay to burn up buildings at the rate at which it has been done in the past.

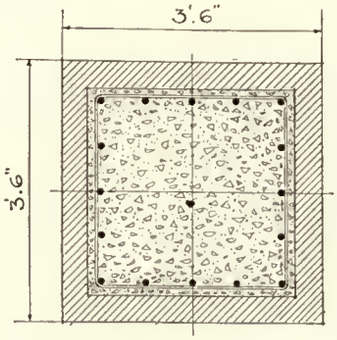


Fig I

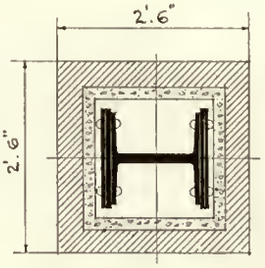


Fig II

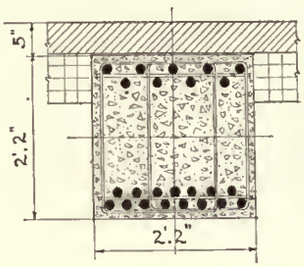


Fig III

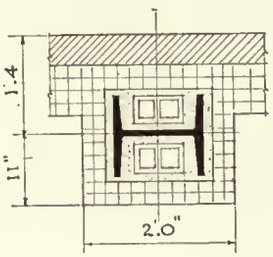


Fig IV

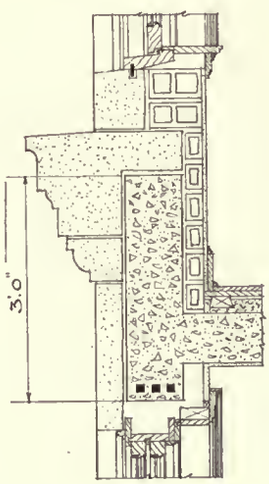


Fig V

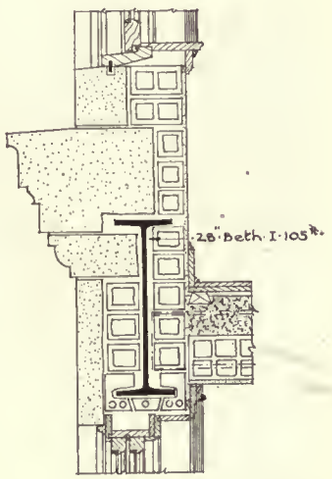


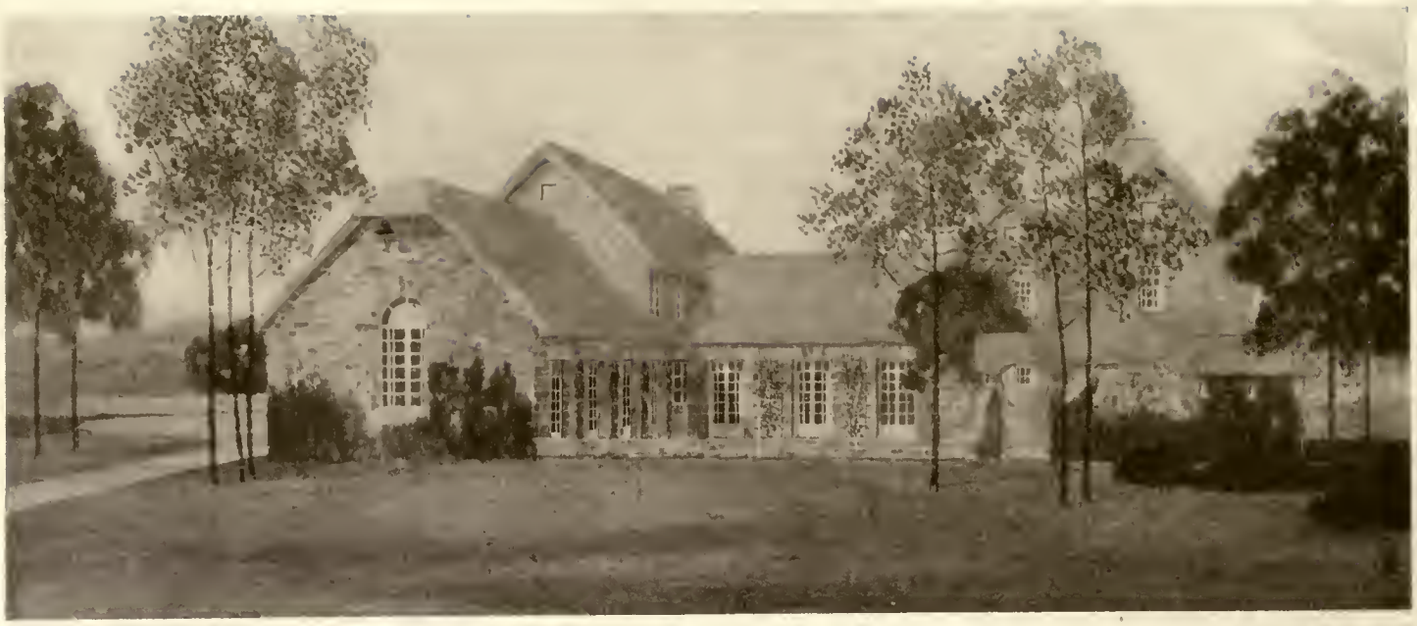
Fig VI

The Therapeutic Value of Color

By William O. Ludlow, of Ludlow and Peabody, Architects

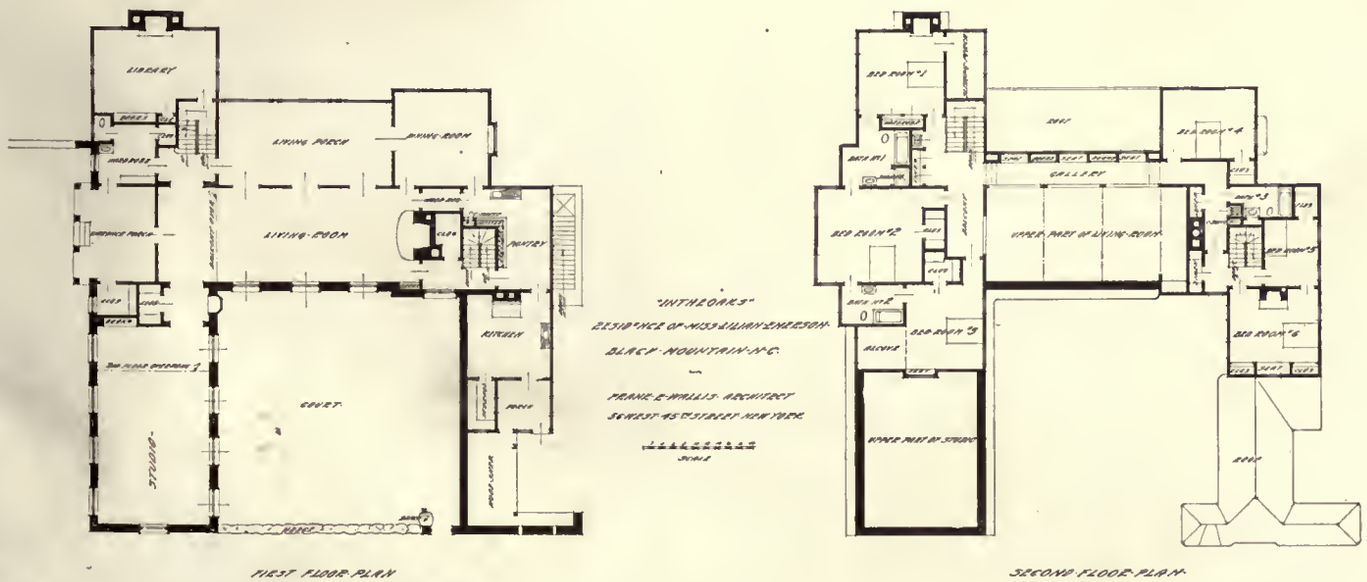
COLOR has a much greater therapeutic value than commonly supposed. High keys and violent contrasts have by experiment been shown to excite the sensory nerves to a degree causing actual distress. Note how sparingly Nature uses red and orange; even the glories of the sunset are allowed to last but a few moments; and the red flower in the fields is exceptional. Were it not that as much light as possible must be conserved in our rooms, green—Nature's predominating, most endurable and most restful color—would be ideal. But, as light is admitted through a comparatively small opening, it is necessary to preserve its quantity by reflection from walls and ceilings of light tones. White is too extreme. The sunlight tones of cream, buff, and yellow should always be used in rooms of north exposure, and French grays, or light Nile green, where direct sunlight is more abundant. Blue is a depressing color when in large surfaces; and pink, which verges toward the red tones, should be used sparingly.

The high tones can and should be used in wall and furniture stencil decorations, furniture coverings, and window-curtains, just as Nature gives cheer to man by fields dotted with flowers—yellow, blue, and occasionally red.



PERSPECTIVE.

"INTHEOAKS," MISS LILIAN EMERSON, BLACK MOUNTAIN, N. C. Frank E. Wallis, Architect.



"INTHEOAKS," MISS LILIAN EMERSON, BLACK MOUNTAIN, N. C. Frank E. Wallis, Architect.

The Study of the Human Figure in Its Relation to Architectural Design

By David Varon
Architecte diplome par le Gouvernement Français

OF late years scholars have earnestly exerted their ingenuity to discover new sources of inspiration for the study of art. Among other such innovators, the late Binet, a French architect, resorted to nothing less than the microscopic study of aquatic animalculæ. He applied his observations to the design of new forms and condensed the results of his remarkable researches in a splendid book.

What Binet did on the eve of the International Exposition at Paris in 1900, for which he designed the monumental entrance, Viollet-le-Duc had done some years before when he contended in his famous Dictionary that mediæval sculptors drew inspiration from close observation of the local minute flora. It was a hint to modern artists.

Viollet-le-Duc and Binet differ only in method. Their ideas are identical: the study of Nature.

But long before either of these hinted at or actually undertook the study of elemental forms of life, men knew —or instinctively guessed—that the foremost study is that of man himself. Philosophers pursued that absorbing study to find the place of man in the universe, and artists considered it the most important factor in art—not only in sculpture but also in architecture.

The world has evolved since the Egyptian era. Many old ideas have been submerged by the surging of new ones; but in the long run the old is restored to its proper place, with renewed tenacity, confirming the word of Ecclesiastes: "There is nothing new under the sun."

We are struck when observing the movements of ideas and events with the close analogy between several phenomena of different character. For examples: Succession of seasons, ebb and flow, progress and retrogression, etc., . . . all these have one thing in common, oscillation. Just like the pendulum, which swings now to the right and now to the left, so it seems to be with the trend of ideas. When the ascending period of a movement has reached its limits, then begins its decline, and reaction sets in.

Nothing is more interesting and illuminative in this respect than to watch what takes place in Paris, this centre of modern culture. After a short period of mad craving for "Art Nouveau," there comes again into its own the reign of the classic, with its Louis XIV style as a protest, so to speak. Gothic architecture, once decried as expressing a barbaric period, again rises in the esteem of our contemporaries.

This can be accounted for by considering that in each of the various Louis styles, or in the Gothic style, there is something more than a mere fad; there is something permanent, and future mankind may revert to the study of these architectures even long after they will have passed out of use, as we do with the Egyptian and Assyrian, because eternal principles are involved in them.

This is also why, after the prevalence of microscopic research and other novel studies—some of them quite odd—in connection with decoration, it is not astonishing that man should again study himself as a source of artistic inspiration.

Fitness of form to function, proportion, character, etc., . . . where can these be observed with greater advantage than in man, woman, or child?

We are indebted to the great painters for the brilliant demonstration which they made of these principles in their immortal masterpieces. Compare the men with the women in any of the paintings of the series of the "Marie de Médicis," for instance. Line, mass, and color all assert man's strength and reveal woman's grace. When admiring these masterpieces the thought occurs that, owing to the ancient Greek morals, the Greek architects could not but have been greatly inspired by the proportions and beautiful lines of man.

The study of man as a basis of a system in Art found its deserved place during the eighteenth century; but its sponsors went to almost grotesque extremes. Thus we see, for instance, Blondel indulging in a fanciful demonstration that the profile of a cornice coincides with that of a man.

When we claim to-day that much may be learned from the observation of animals, and particularly of man, we have in mind no cartoons or caricatures, but solid principles. Most scholars admit the necessity of studying the law of creation from many standpoints. Yet how little is this necessity understood by the great majority of those taking architecture as a profession.

It has taken mankind countless centuries, from the time when the cave drawings were made down to the founding of the Ecole des Beaux Arts, to organize the study of nature, and particularly of art, and it is not until the Renaissance that we find artists dissecting cadavers to study anatomy. The study of the human figure has become a subject of importance in all schools of art, and naturally in schools of architecture. The trouble is, as with other good studies, that people fail to realize its importance. How many students see the necessity of such a branch of study in connection with house-building? Are they not at school to learn construction, and nothing else, so as to enter very soon into active practice and make money? What is the use of wasting time in drawing from the nude? "Man as a subject of study," thinks the student, "would be interesting from a psychological standpoint as a prospective client." (And most students nowadays think very earnestly that this is the most important part of the profession, and therefore indulge heartily in social activities at college.) "This is all nonsense. We no longer live in the Stone Age, when man could learn to build by watching the beaver. Thank God we are pretty well advanced in the art of building. Let those who study aeronautics inspire themselves from the bird as much as they want. It is all right; but we fail to see the connection between the study of the nude and architectural design. We agree that there may be beautiful lines with which it is good to become familiar; but that is all. Better to devote the same amount of time to strength of materials, or to specifications." Such indeed is the average student's reasoning. It is a pity to see young men shunning the best part of their studies. I do not deny the importance of technics—of all that goes to make the practical side of architecture. But it is incontrovertible that among the problems that the architect

has to solve, adherence to æsthetic principles is one of the most important.

Architecture, by its very definition, consists in building in conformity with the laws of mechanics and æsthetics. Far from denying the value of the practical side, I believe that from the great diversity of modern needs a modern style of architecture will be evolved. But it is regrettable that so many fail to understand the purpose of the study of the human figure in connection with our art.

We are all of us great admirers of the Greek school of architecture. In fact, we are dominated by the Hellenic idea in whatever pertains to art, and naturally enough, for in Greece sculpture arose to its height and modern architecture had its birth.

The spirit of analysis led the Greeks to sift through every human thing, every thought. And the rationalism which they applied to their philosophic inquiries they also applied to their art. Seeking the secret of beauty in the human body, they soon evolved the theory that, Nature aiming at making everything beautiful which is healthy, the most beautiful human being must be the healthiest one. As they also understood the relation between the parts of the body, their system of gymnastics never made one limb or part of the body grow to the detriment of another, but developed all parts harmoniously. They were first to understand the specific importance of each organ corresponding to its function, and that is why their architecture, and particularly the Doric order, has so much expression. It is, indeed, a wonder of eloquent simplicity.

With them, proportion took all its importance in architecture. The modern critics who so strongly attack the so-called classic architecture are the remote disciples of the Greek school. To grasp the spirit of this school just compare a Hindu composition of architecture to the Parthenon, the intricate details of a mere column in a rock-hewn temple to the grand simplicity of a Doric column. The one speaks to a public whose minds are peopled with a multitude of legends, while the other is addressing cultured minds. Mankind at that stage felt self-possessed, and to express beauty no longer needed to copy Nature's forms, as the Egyptians did in most of their structures, to convey to the mind ideas of grace or strength. Strength, grace, and richness are successfully expressed in the Greek art by mere proportions. It is said that the Doric column tries to express the proportions of a man, while the Ionic interprets those of a woman. This is another way to say that the Doric order represents strength, while the Ionic represents, and how well, grace. If we admit the Greek point of view that our buildings must not be mere agglomerations of more or less decorated elements meant to attract the vulgar, but aim at expressing beautifully our aspirations, then each element ought to fulfil its purpose beautifully. Plato, to quote the late Guadet, said: "Beauty is the splendor of truth." Instead, we see columns and arches, wreaths and garlands, indiscriminately distributed on any design, as if they had been splashed on at random, for the sole purpose of satisfying the common craving for architectural forms. One might say: "And why not? Should not the artist abide by the law of supply and demand? If the public want it, why not give it to them?" It sounds reasonable, but let us not forget that the public is growing more and more enlightened, that ere long it is going to be tired of replica of exotic structures. The public is learning to read rational and expressive architecture, and soon will require more. Let us then be ready for that. Just now let us see what are the important points which can be derived from the study of the human figure.

Fundamental rules for all arts are that there must be unity and variety. There must also be simplicity. These principles are exemplified in the human body. It is composed mainly of bones and flesh. The former assume each a peculiar shape—the shape best fitted to have it efficiently sustain its particular load, without being excessively heavy. Take the arm, for instance. Compare the three bones of this limb, which is created for the exertion of effort in definite directions, as ordered by the brain, to the numerous ribs, whose main function is to protect the vital organs. No conscious exertion has ordinarily to be made with our chest, and yet it has to resist pressure in some cases of danger to the vital organs. The lungs breathe, and this also requires the ribs to be flexible. Here we have number, with unity in the purpose of resistance and variety in the degree. The same reasoning is to be applied to any muscle.

We know that a muscle has to be able to contract and relax. This is the common unity in the great variety. Compare only the biceps and the latissimus dorsi, and you will soon have a striking idea of what variety in the unity means.

Applying this principle to architecture, we draw the plain inference that wherever the structure is a massive one, the support or the column ought to have a different expression from that where the weight or height is less. Instead, we not infrequently see buildings strewn with columns, the same one used at the top and at the bottom. How can the word rationalism be applied to such structures? In this way we give the public a false idea of art. How differently did the Greek architects build for the Romans! With what refinement did those architects study the succession of their superimposed orders, giving more strength to the bottom one and more refinement to the upper ones! I cannot account for those faults in many of our public buildings except by indifference in the study of Nature and particularly the human figure in relation to architecture. It is high time that a young man who is going to enter the profession should be well aware of the motives which led his ancestors and superiors to the introduction of his various courses of study. And let the student thoroughly understand that just as a book is subdivided in chapters, the chapters in paragraphs, and so forth, so is the Greek architectural composition. The Greek order is a wonder of simplicity and of clearness. The shaft, whose function is to support, is barren of ornaments; only the flutings to emphasize the vertical and give added color; then as the eye rises it meets centres of interest, the cap being the first one. Its location is a very proper one as being the transition from the vertical support to the horizontal lintel. We know that in the Doric order the cap, besides serving an æsthetic purpose, relieves the architrave. This is what accounts for the strong echinus of the Greek Doric order. Then the entablature, which is another chapter in the same order, and is subdivided into three paragraphs, the interest increasing as the eye travels from the one to the other. Most of the forms which we meet in the cornice are dictated by needs. So, for instance, is the corona which was to keep the walls free from rain, as also is the Cima, which is nothing but a gutter, and the lions' heads on the Cima which were ducts, as were later, to some extent, the gargoyles of the Middle Age. An observing mind easily sees how the lions' head and the projecting gargoyle are alike. On the one hand, the cornice itself protruded so much that the water fell from the lion's mouth far from the foundation, while in Gothic architecture the cornice jutted out slightly in relation to its height, and made necessary bristling gargoyles. To-day we feel the need of still greater protection, and neither lions' heads nor

gargoyles would do when we have regard for the finery of a lady passing by the building. And this is why no more use is found for lions' heads, except as traditional relics and decoration.

We have seen that even the articulation of two bones is of interest to the architectural designer. Considering now the human face, nay, even the animal's, we notice at once that each half of symmetrical organs is so constructed in its outward appearance that it seems as though it alone could never fit the face. Each eye, for instance, is one-half of the organ of sight, and the disposition of the whole denotes that it is needed to gauge distances accurately. Of course one can see with a single eye, but it is by a prodigy of skill and with long habit that those so afflicted permanently can perform work which requires binocular sight. It is not uncommon to hear such persons complain of headache after they have done applied work.

By such an apparent digression I have tried to show how we may study upon our neighbor's face a principle which is of paramount importance in architectural design. When parts of a design are so placed as to imply symmetry there should be no clash, no incompleteness.

The mediæval architects knew this, and although the unsymmetrical cathedrals like that of Chartres preserve some odd features that make them remarkable and the centre of much interest on the part of tourists, yet those of Paris, Amiens, or Reims, etc., will forever claim the attention and command the respect of the spectator.

And, since we are speaking of the Gothic cathedrals, it is not irrelevant to point out the remarkable analogy between many of them and the human figure. Viewed from the side the cathedral may be easily compared to some sort of colossal statue representing the new religion raising her hands as a signal to rally around her. It seems almost as though you would soon see it move. This effect is undoubtedly due to the rhythm of the lines in profile. The cathedral does not in this respect satisfy those critics who want buildings to inspire the idea of immutability like the pyramid, which is the best expression of perfect balance and everlasting stability, but this objection shows the cathedral under even better light, for it represents a new conception of the architectural art. Like sculpture, architecture has become expressive. It has borrowed many points from the stable pyramid and combined them with principles which we find illustrated by the human face. Observe the towers of cathedrals. Being situated on either side of the centre, they are each one asymmetrical, the outward corner of each being always the strongest, thus affirming the fact that neither tower could exist separately in this manner, but must be part of a whole.

Wherever circumstances require absolute symmetry, its absence mars appearances, the impression being one of ill fate, or of a whole composed by different minds at different times, which, by the way, is true of many cathedrals. But in most cases of old buildings with more recent additions, the differences in color or in the weathering are sufficient notice to the intelligence, so that a strict symmetry is not expected. The age of the structure is thus written on it.

Passing now from mere details to grouping or designing, we find in the human body splendid teachings. Elaborate in its component parts as this body is, how simple its outward appearances! Vital and other organs are so wonderfully combined as to allow the whole to be very simple, hence safer from trouble. Notice now the merging of the head above the shoulders. What could be more eloquently and simply done? The king of creation may with ease scan a wide angle without budging his body, exerting his watchfulness in a royal manner in all directions but the rear, in keeping with his ambitious instinct to forge ahead. The majesty of man, that which makes him close to divine, is attested by his simple appearance. All his means of defense lie within his brain, and his hands are the most perfect tools that nature could bestow upon him.

It has been made clear above that there is a lesson to be derived by the artistic scholar from this close observation of man. The least that a student architect ought to learn from this analysis is: simplicity of design, no matter how intricate the problem. Head, chest, abdomen, and limbs are the four chapters (or five by counting arms and legs separately) of the body, which contains hundreds of organs for different functions. Yet they are so wonderfully combined that five names are sufficient to head them: the senses (or head), vital organs and blood circulation (or chest), digestion (or the abdomen), locomotion (legs and feet), prehension (the hands).

In the same manner the good professors have always taught design. Starting from the plan, we must think of the main functions that are to be performed by the parts of the structure; then we will try to compose the different parts of each function harmoniously and in keeping with the whole, making the most important—however small in comparison with the structure—a conspicuous feature. There again the analogy with the human being is striking. All the various organs of the body are but servants of the head; they form the bulk. Yet the head is the most conspicuous part of man, because of its location, its modelling, expression, shape, and coloring. It far exceeds any other part of the body in interest and in beauty.

This goes to show that a chief feature in a public or a private building does not necessarily require to be huge. A town hall, for instance, by its very definition is the hall of the people. But the importance of the town determines that of the subservient parts. Thus, while the aldermen's chamber will constitute nearly the whole structure in a small town, in a large city this head of the city hall will have so many subordinate parts that it will require sometimes an additional feature like the traditional little belfry to make it conspicuous. From the careful study of this relation of the "head" of a composition to the "body" may ensue the character of the composition. Simplicity and clearness, without disregarding proportions, are essential both for the sake of easy preservation and for grandeur. No sooner do we begin to complicate our main lines than we drop into the realm of the fanciful, and consequently of weakness.

Of course there are exceptions. Fancy, even frivolity, in the appearance of a residence may convey to the observing mind the idea that the house needs no special care for its preservation, its tenants being safe from attack. Apparent weakness in this case becomes the expression of self-confidence. (Like Sparta of olden times, which had no walls to protect her from the foe, relying for this task upon her youths.) The Palace of Versailles, though majestic and somewhat severe, in its general lines, is the expression of peace when compared with the fortified château of the Middle Ages.

Editorial and Other Comment

Encouraging Good Taste in Architecture

THE recent award of prizes in New York City by the Fifth Avenue Association for the best new or remodelled buildings erected during the year were given with an encouraging consideration for sanity and reserve in design. We are hearing, now and then, considerable oratory and reading quite often appeals for originality and the so-called Americanization of our architecture, but as a rule in the final analysis there is a feeling that a proper respect for tradition is worth while, and above all a sensible consideration of the fact that in architecture, as in clothes, conservatism is best.

The first prize was given to the Textile Building, Inc., on Fifth Avenue, designed by Sommerfield & Stechler, a building of dignified appearance, well proportioned and, above all, adequately lighted for its use as stores and offices. The second prize went to the New York Bible Society for its building, at 5 East 48th Street, designed by Wilfred E. Anthony, architect. We should have inclined to put it number one, for it seems an especially happy and appropriate design for its purposes with its elements of ecclesiastical Gothic.

The prizes for alterations were given to J. and J. T. Cousins, 17 West 57th Street, George A. Schonewald, architect, and to Schmitt Bros., 523 Madison Avenue, Schwartz and Gross, architects.

The architectural harmony committee has done fine work in putting restraint on the vagaries of both owners and architects who are tempted to build without regard for the general artistic good. Without putting any unreasonable restrictions upon construction, this committee has, in general, kept recent developments in the business district fairly within the limitations of good taste and good architecture.

A number of alterations and new buildings have taken the place of old structures on Fifth Avenue in recent years, and with few exceptions one can look them over with a considerable degree of satisfaction. In fact, both the native New Yorker and the visitor "in our midst" can study many of these recent buildings with profit to his knowledge of architecture in general.

We often wonder if the average man in the street ever stops long enough to notice whether a new building has any merit beyond its mere bulk worthy of a little serious observation. He will look up to the sky-scrapers and marvel a brief moment until the next one comes along, and ignore the modest little building that may be a much greater achievement.

Thousands know the names of the big buildings, but it would be an exaggeration to say that even hundreds know the names of the architects who have designed them.

It is this way not only with our business structures but as well with many of our national and local monuments.

A building is a building, nothing more!

Going Up

WE may at least find much encouragement for the future in recent facts supplied by the F. W. Dodge Co.'s review of building activities. Last year's figures have been improved, with residential buildings leading all other classifications. Predictions are made that present increased activities will continue into the winter months. People have become tired of waiting as well as hopeless of any material reduc tion in costs and are going ahead under forced draft to build places in which to live. With every possible effort there is no possibility of catching up with the pressing need.

"Conditions now are much more favorable to the home-builder than they were last year. If expected improvements develop in the field of finance and a substantial recession is had in the cost of building loans by spring, it will be possible to say to the prospective home-builder, without reservations or equivocation, that he takes no unusual chances on his building investment."

French Architects to Teach at Harvard and the Massachusetts Institute of Technology

TWO distinguished French architects, Albert Ferran and Jean Jacques Haffner, both of them winners of the Grand Prix de Rome, one of the highest honors to which architects aspire, have accepted invitations to come to this country to teach. Ferran will have charge of design at the Massachusetts Institute of Technology, where he will hold a professorship, while Haffner will be professor of design at the School of Architecture at Harvard.

Upon their arrival, it is said that Boston will be the only place in the country where two Grand Prix winners are united in teaching architecture in schools which co-operate closely. The departments at Harvard and M. I. T. frequently engage in "conjunctive problems" in architecture, a fact which will give Ferran and Haffner a chance to work together and supplement each other's gifts. The two men, both of whom speak English fluently, are close friends.

Who Is to Blame?

THE recent collapse of a theatre building in Brooklyn with a lamentable loss of life and the serious injury of many workmen engaged in its construction should be relentlessly traced to its causes, and those responsible punished to the extent of the law. Speculative building, without regard to every precaution against even the thought of such happenings, should not be possible. Think what might have happened if the building had been completed and it had fallen upon an audience of hundreds of people. Rainy weather is certainly no excuse, and economy that permits the use of poor and doubtful materials is no less than criminal.

Book Reviews

DANIEL H. BURNHAM, ARCHITECT, PLANNER OF CITIES. By Charles Moore. With illustrations. 2 volumes. Houghton Mifflin Co., Boston.

This monumental life of Mr. Burnham, one of the foremost American architects, by Mr. Moore, his long-time friend and associate, becomes, by reason of Mr. Burnham's relations with other kindred spirits of his time, a notable record of the personalities of a remarkable group of American artists and architects. Mr. Burnham came of stout New England ancestry, and was a boy of the regular sort, whose later career was developed by sheer force of inherent will and a fine degree of sympathy with and understanding of the capacities of other men with whom he became associated. He had the rare qualities of a good organizer combined with a vision of the things that lay beyond mere business efficiency and belonged to the domain of the imagination. The two qualities are essential in all big achievements, and Mr. Burnham's life manifested the truth of this statement in a high degree.

"He was never so much of a business man that he was not also an artist. He felt as an artist, thought as an artist, and when he came up against his limitations in knowledge or as a creator, he never failed to recognize those qualities in others."

How true are these words when we read of the partnership formed with John W. Root, and of the way these two men of such different temperaments worked together to such notable ends, and how they account for the great achievement of Mr. Burnham's life—the wonderful and beautiful World's Fair at Chicago.

No one man's genius could have realized such an achievement. It took a man of great executive and organizing ability and a man big enough also to recognize the ability and special training of the men with whom he surrounded himself. The story of the building of the World's Fair is a story of the Renaissance of American art and architecture. To be sure, this began with the Centennial Exposition at Philadelphia, but at Chicago it passed its infancy and showed signs of a fine maturity worthy of the country.

Associated with Burnham & Root were Richard M. Hunt, McKim, Mead & White, George B. Post, Peabody & Sterns, Van Brunt & Howe, Burling & Whitehouse, and other noted firms. Frederick Law Olmsted was the chief landscape architect. But these bare statements signify little unless we go further and speak of the splendid and inspiring spirit of enthusiasm that united all concerned in the enterprise and the friendly intimacies that developed not only among the architects but among the painters and sculptors who added so much to the distinction of the buildings. Saint Gaudens co-operated in the selection of the sculptors, and Frank Millet, that prince of friends and fine artists, was a never-failing and willing aid and promoter of good humor and remover of friction. McKim's force and fine taste and scholarship were early in evidence, and Charles B. Atwood, who became a member of Mr. Burnham's firm, was a large factor in the work of the Fair. One of the most interesting chapters of the book is that on "The Friendships of the Fair," a story of the intimate associations of the architects and artists who gave themselves without stint to the successful accomplishment of the result.

It is an intimate biography that Mr. Moore has written, and the letters, extracts from diaries, speeches, and comments upon all sorts of occasions have a personal interest for all those who would follow Mr. Burnham's career in detail. He was a national figure concerned in many important national and local civic developments, such as the Senate Park Commission Plan in Washington, the new West Point, the Union Station at Washington, the Civic Centre at Cleveland, the San Francisco Plan, the Chicago Plan, the Plan of Bagnio, Philippine Islands, and the city of Manila. The information contained in the chapter on the building of the Washington Cathedral will be read with much interest.

In 1893 Mr. Burnham was elected president of the American Institute of Architects at Chicago, and he was prominently identified with the American Academy of Rome, of which Charles F. McKim was the founder.

Mr. Burnham's various trips to Europe brought him much needed recreation and gave him many new impressions of Old World architecture. His letters from Europe are full of interesting architectural comment, especially those upon some of the great Gothic cathedrals.

The firm of Burnham & Root was the designer of the famous Montauk Block in Chicago, known as the first "sky-scraper," precursor of the great tall buildings that have followed all over the United States.

The book is the story of the beginning and growth of Mr. Burnham's career, of his methods of thought and work, of his association with the leading men of his time, and of his many contributions to architecture in America. It is a notable contribution to our architectural history. The illustrations add greatly to the value and interest of the volume and include a number of full-page drawings reproduced in color and a fine portrait of Mr. Burnham from the painting by Zorn.

The complete chronological list of buildings designed by Burnham & Root and by D. H. Burnham and by D. H. Burnham & Company gives an impressive idea of the breadth of Mr. Burnham's activities and the immense volume of business involved.

SMALL FRENCH BUILDINGS. The Architecture of Town and Country, Comprising Cottages, Farmhouses, Minor Chateaux or Manors with their Farm Groups, Small-Town Dwellings, and a Few Churches. By Lewis A. Coffin, Jr., Henry M. Polhemus, and Addison F. Worthington. Charles Scribner's Sons, Publishers, New York.

The authors of this handsome and valuable book, who are all practising architects, planned the work while serving with the army in France.

They were impressed with the interest and suggestive values of the simple buildings they saw in the small towns and surrounding country, and realized the great lack of any really satisfactory collection of photographs in this attractive field.

They have done the profession a service in making available so many interesting examples of the minor architecture of France, so rich in its variety and so suggestive in its picturesque use of materials.

The illustrations cover a wide range of country and offer to the architect a little-explored field. It is surprising to know how little available material has been accessible until the publication of this book.

The small-town architecture of England and Italy is well known, but for some reason France has been overlooked. And yet few countries offer a more interesting field for the architect. One well-known firm of American architects has written the authors thanking them for the help obtained from one of the farm groups shown among the illustrations.

The illustrations are grouped under the following heads: Cottages, Chapels, Town Houses, Chateaux, Manors, Farm Groups, and Details. There are a number of measured details and drawings in pen and ink.

In the introductory text to each section is pointed out particular features worthy of especial attention.

The plates, printed in a brown ink, have an exceptionally attractive and artistic richness of effect that adds much to the appeal of the book, which has won the instant approval of every architect who has seen it.

ENGLISH CHURCH MONUMENTS, A. D. 1150–1550. An Introduction to the Study of Tombs and Effigies of the Mediæval Period. By Fred H. Crossley, F.S.A.

The author deals with the materials, origins, and makers of the old tombs and effigies that are such a notable feature of the English churches and with their color decorations. For the architect the chapter on "The Architectural Decoration of Tombs and Country Chapels" is especially valuable, and as well the one dealing with Costumes and Brasses. The illustrations tell the story of the development of the art in the construction of these church monuments, and in fact provide a very complete graphic history of the varied architectural forms the memorials display, and the changes that took place in the carvers' ideals.

It is a valuable book for the architect's library and for all those concerned in the designing of church and other monuments. The book covers a field but very inadequately represented heretofore. There is a very full index, and a glossary of terms that adds much to the value of such a reference.

HOMES OF MODERATE SIZE. A Collection of Photographs and Plans of Modern Suburban and Country Homes, following the Colonial, Italian, and English architectural styles, and arranged accordingly. Selected for their artistic merit and adaptability to the needs of the average American family from the work of Kenneth W. Dalzell, Architect, M.A.IA. Arranged and edited by Edward F. Hammel, Architect. The U. P. C. Book Co., Inc., 243–249 West 39th Street, New York.

Mr. Dalzell's work is well known, and he has to his credit a number of attractive homes in the New Jersey suburbs, notably at Maplewood.

FURNITURE AND INTERIOR DECORATION OF THE ITALIAN RENAISSANCE. By Frida Schottmuller. With five hundred and ninety illustrations.

The large number of excellent plates make this book one of exceptional comprehensiveness and value. Brentano's, New York.

MODERN BUILDING SUPERINTENDENCE AND THE WRITING OF SPECIFICATIONS. By David B. Emerson. Charles Scribner's Sons, Publishers, New York.

A little book written by a man of long experience in the profession, simple and direct in style, that should be in the library of every draftsman and student and of practical service to those concerned in up-to-date building methods. The chapters on specification writing should prove helpful to the young architect.

THE WOODWORKER SERIES

DETAILS OF CABINET CONSTRUCTION—WOOD TURNING. J. B. Lippincott Co., Publishers, Philadelphia.

These handy little volumes with their numerous illustrations and explicit texts are mighty useful books to have around. They tell how to do so many things with which every householder is concerned, and they will appeal with fascinating interest to the handy man or woman about the house, to every one who likes to make things with tools.

The series is one of every-day practical service.

PRACTICAL STRUCTURAL DESIGN. A Text and Reference Work for the Engineers, Architects, Builders, Draftsmen, and Technical Schools; especially adapted to the needs of self-tutored men. By Ernest McCullough, C.E., Ph.D., Member American Society, Civil Engineers, Lieutenant-Colonel, U. S. Army, A. E. F. Second edition. U. P. C. Book Co., New York.

The book deals with External Forces, Internal Forces, Problems in Design of Beams, Girders, and Trusses, Joints and Connections, Gothic Statics, Columns and Structures, Semi-rigid Frames.

The author says "that 95 per cent of the work done in the design of structures could be explained to men whose knowledge of mathematics does not extend beyond that taught in high school."

RESIDENCE, MRS. GLADYS WATSON ZIEGLER, 2 EAST 63D STREET, NEW YORK.

Sterner & Wolfe, Architects.

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ENTRANCE DOOR.

HALL.

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STAIR HALL.

MAIN STAIRWAY.

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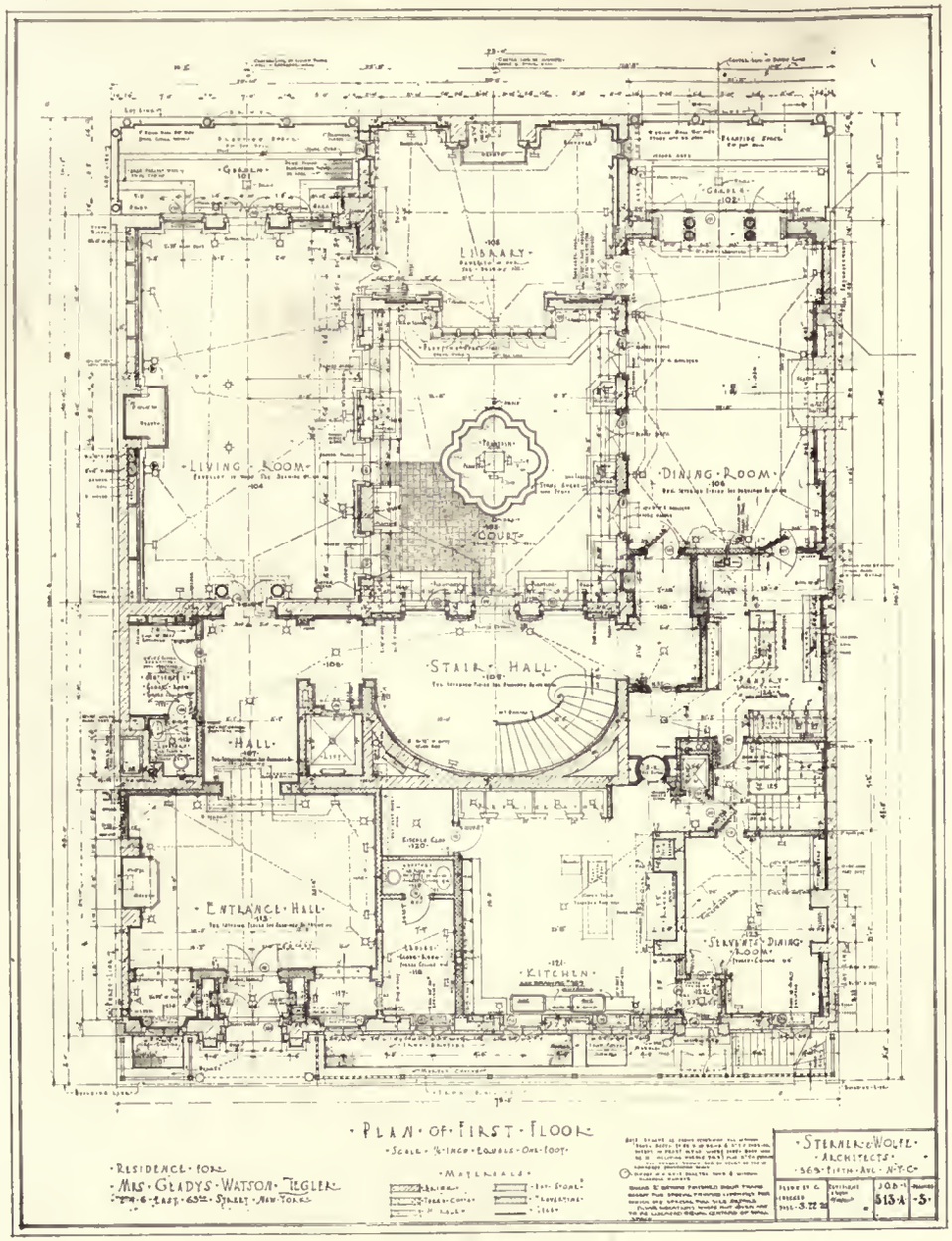
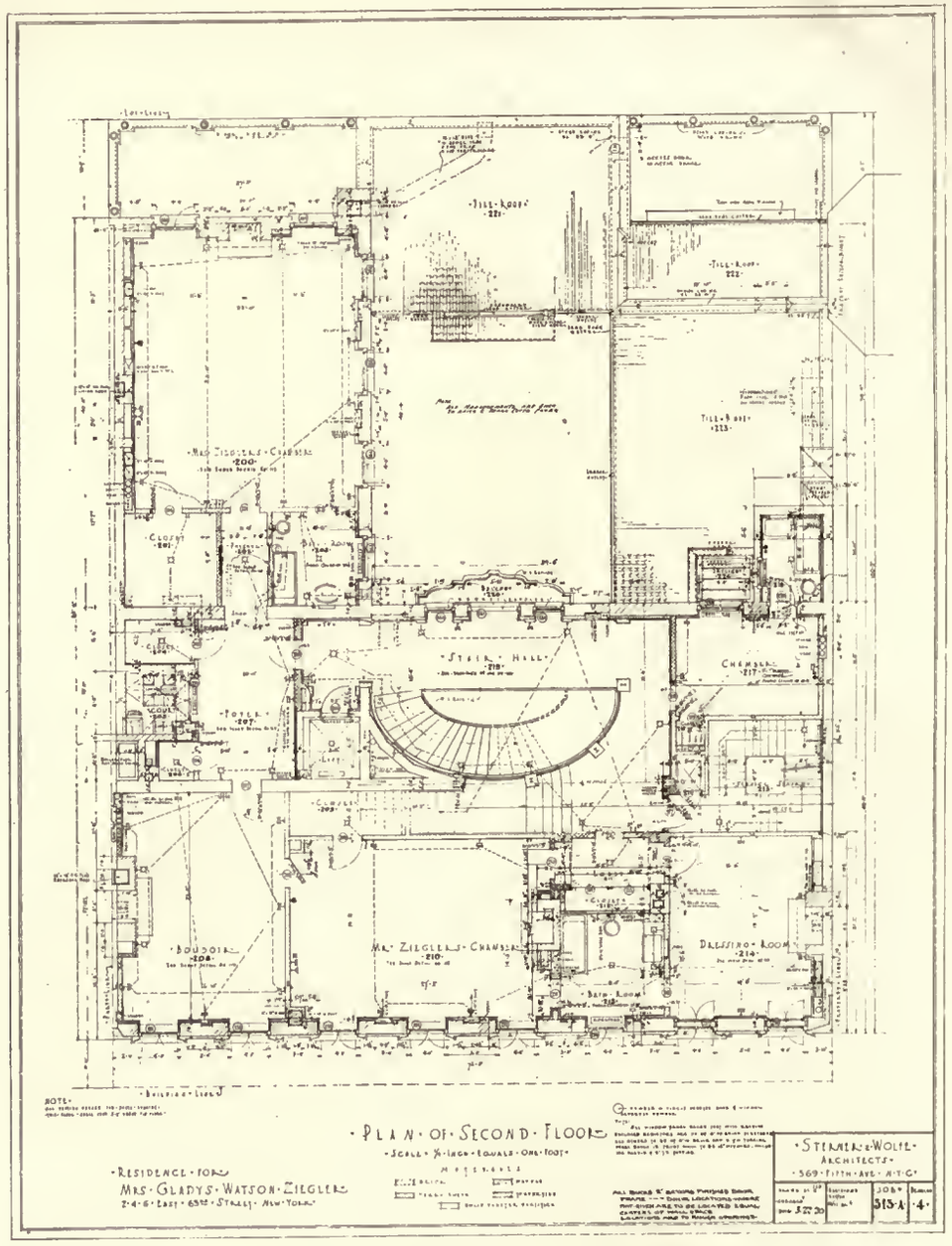
Sterner & Wolfe, Architects.

RESIDENCE, MRS. GLADYS WATSON ZIEGLER, 2 EAST 63D STREET, NEW YORK.

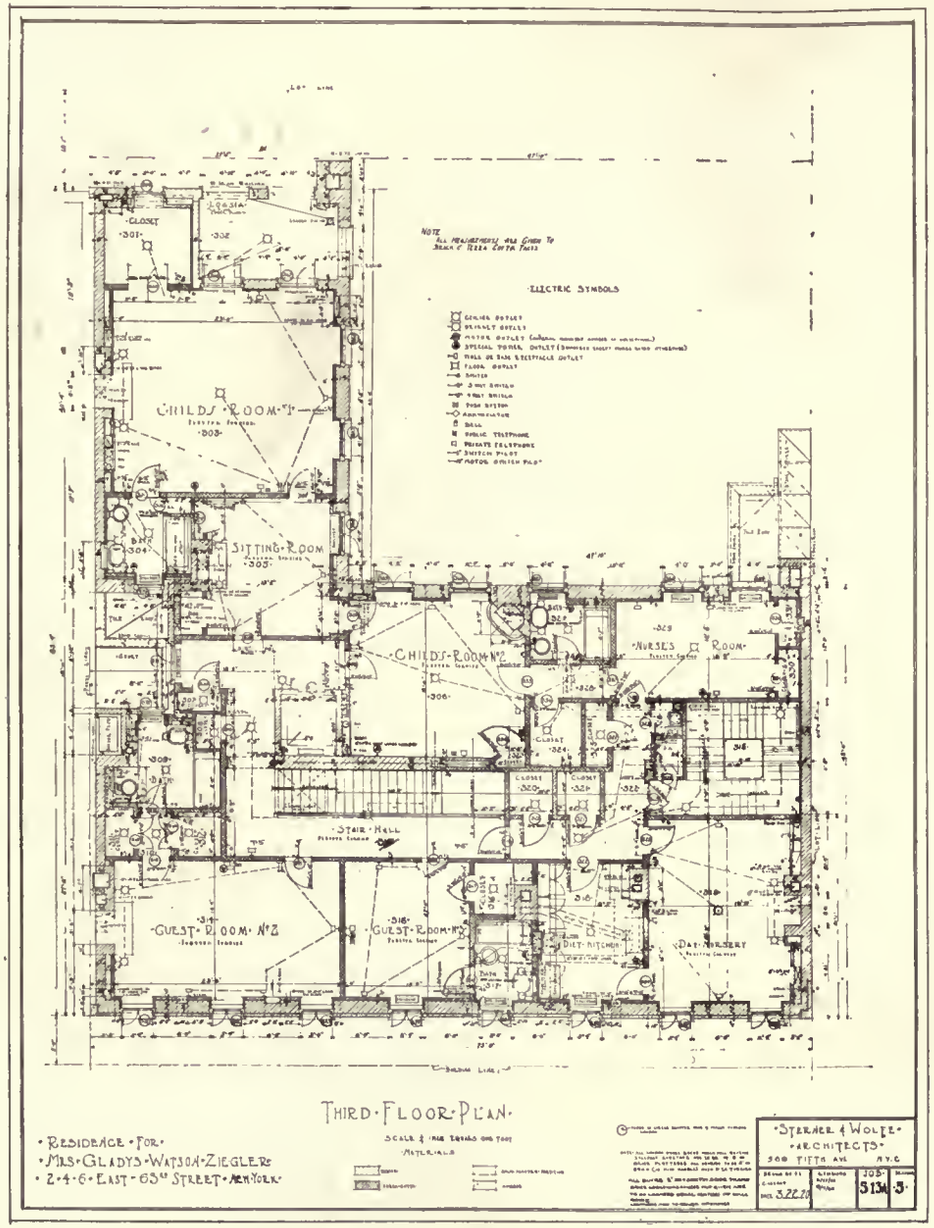


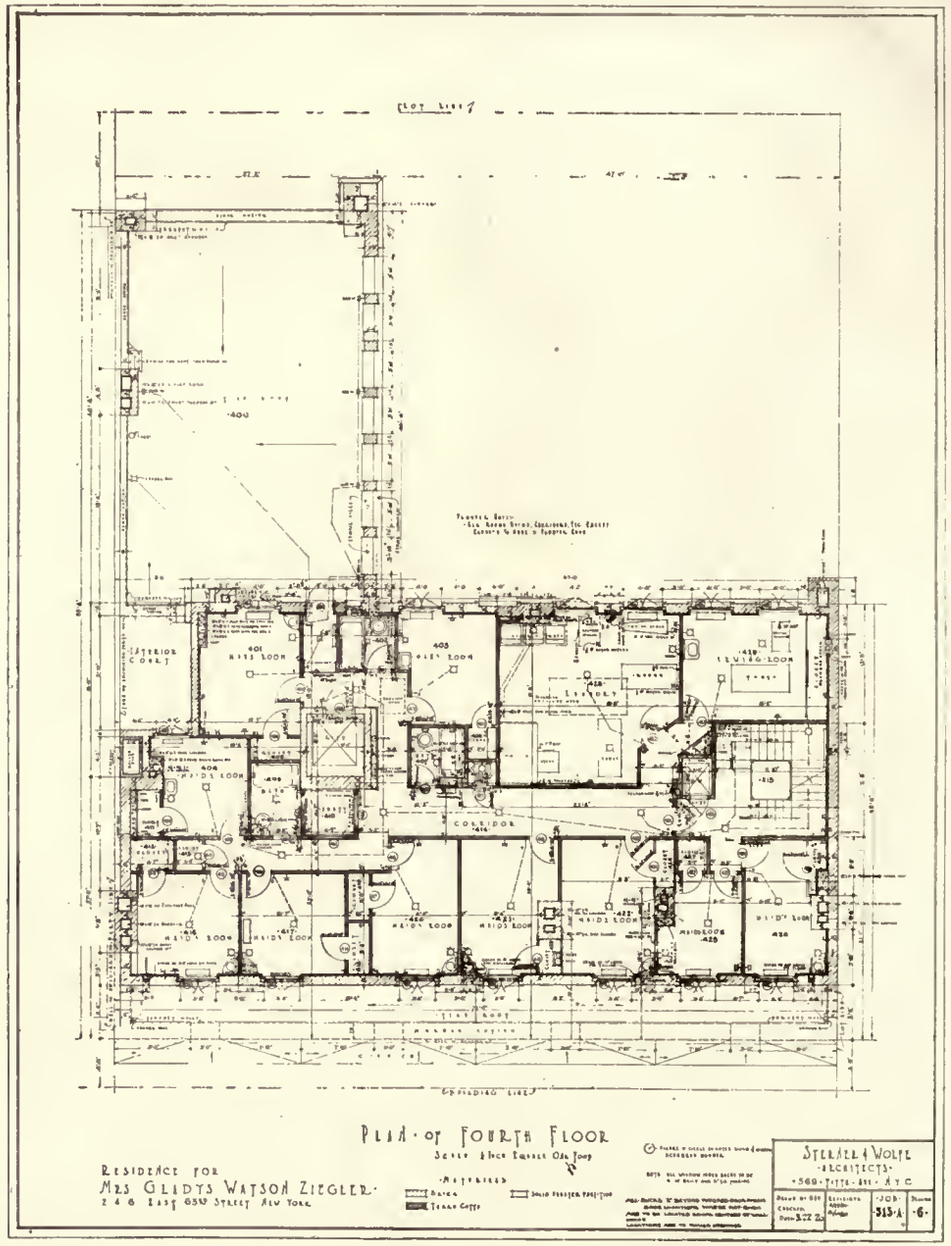


PLANS.

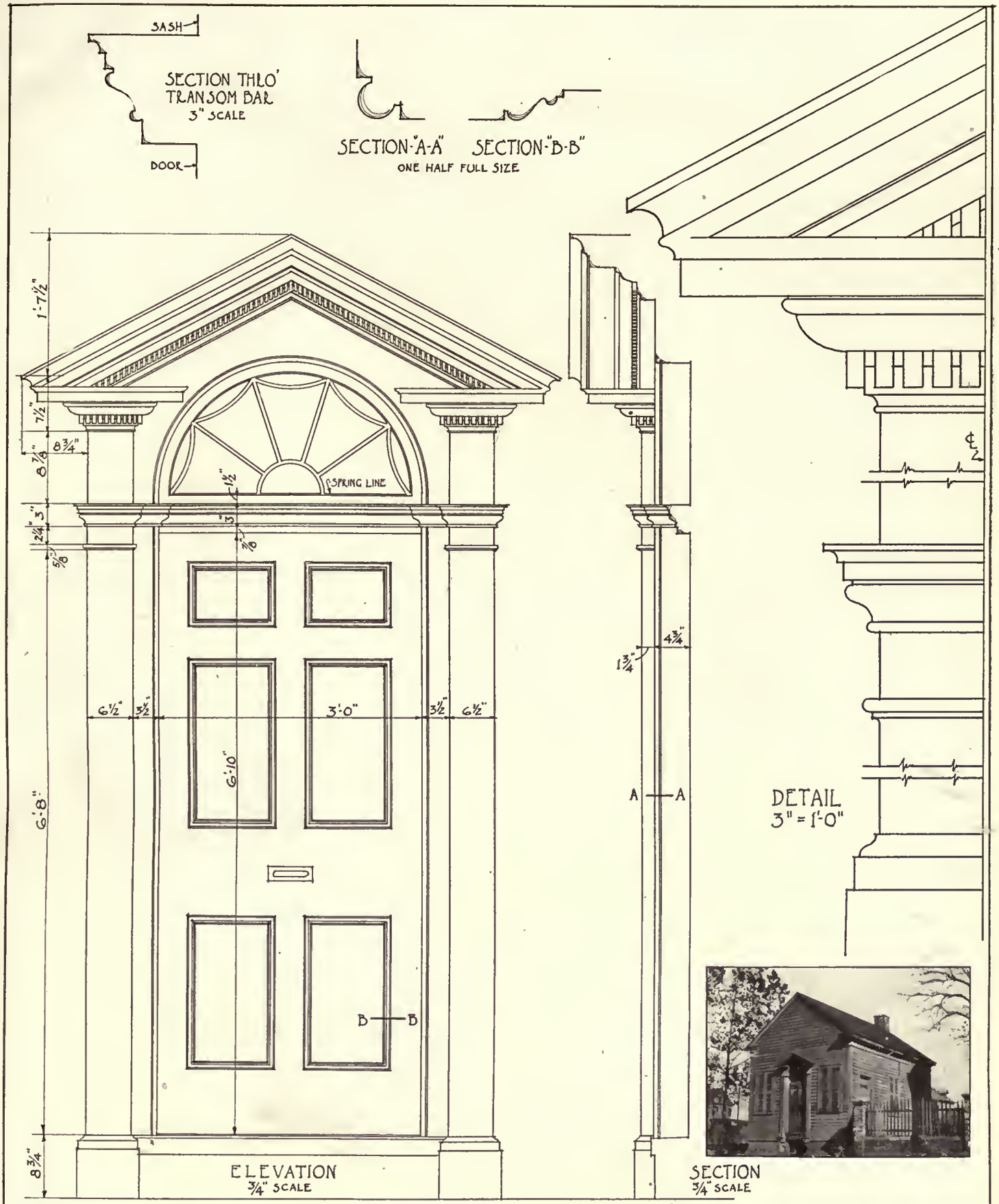
RESIDENCE, MRS. GLADYS WATSON ZIEGLER, 2 EAST 63D STREET, NEW YORK.

Sterner & Wolfe, Architects.





PLANS, RESIDENCE, MRS. GLADYS WATSON ZIEGLER, 2 EAST 63D STREET, NEW YORK. Sterner & Wolfe, Architects.



COLONIAL ARCHITECTURE of the CAROLINAS	DOORWAY - JUDGE DONALD'S LAW-OFFICE DATE-ABOUT-1790 165 CRAVEN ST., NEWBERN-N.C.	MEASURED & DRAWN by J.A.ALTSCHULER

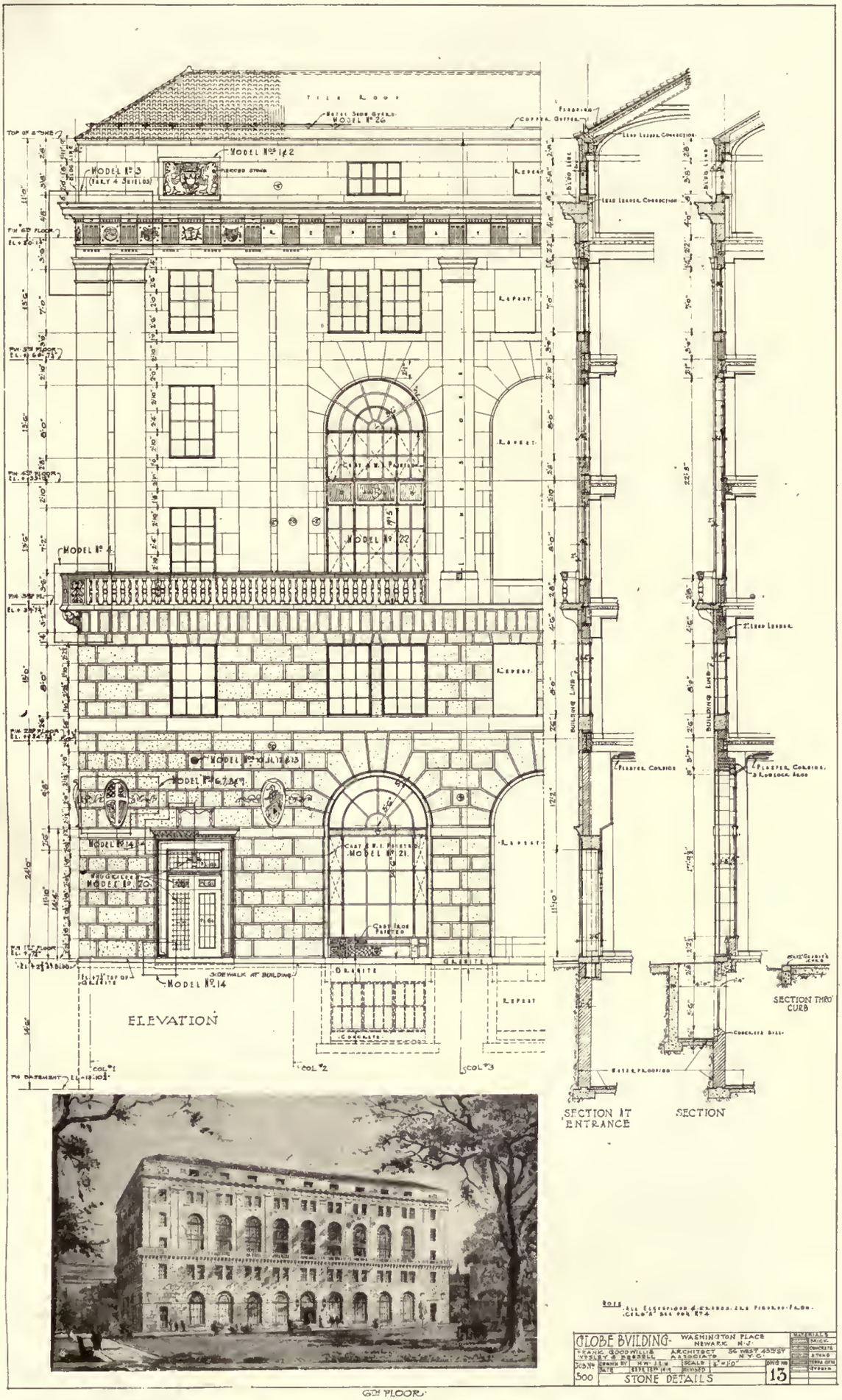
ADMINISTRATION BUILDING, THE GLOBE INDEMNITY CO., NEWARK, N. J.

Frank Goodwillie, Architect. Wesley S. Bessell, Associate.

MAIN ENTRANCE, ADMINISTRATION BUILDING, GLOBE INDEMNITY CO., NEWARK, N J.

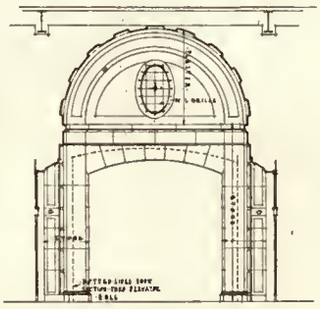
Frank Goodwillie, Architect. Wesley S. Bessell, Associate.

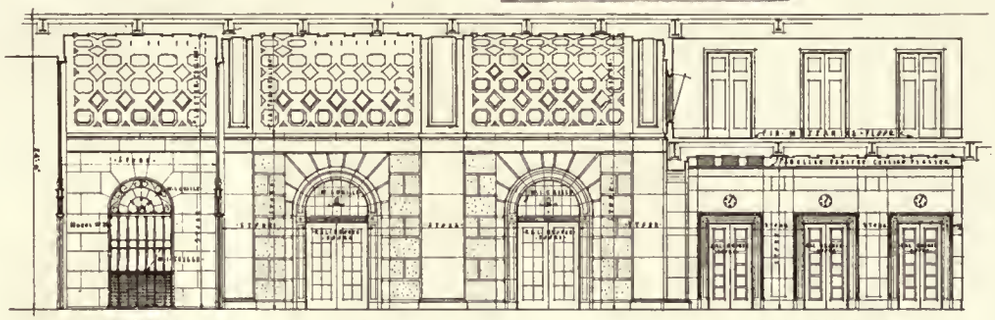
ENTRANCE-HALL AND ELEVATOR LOBBY, ADMINISTRATION BUILDING, GLOBE INDEMNITY CO., NEWARK, N. J.
Frank Goodwillie, Architect. Wesley S. Bessell, Associate.



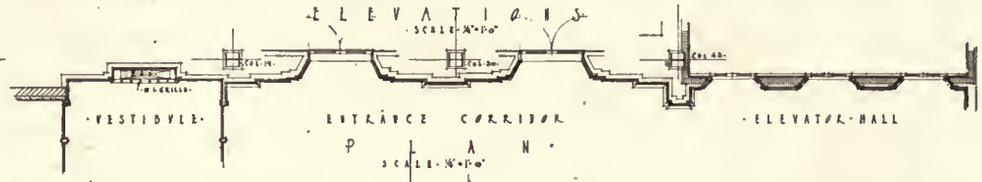
DETAIL SHEET, ADMINISTRATION BUILDING, GLOBE INDEMNITY CO., NEWARK, N. J.

Frank Goodwillie, Architect. Wesley S. Bessell, Associate.

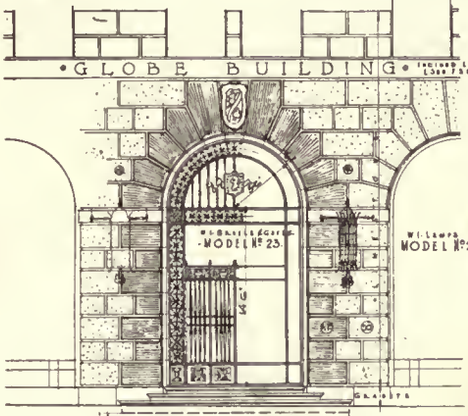


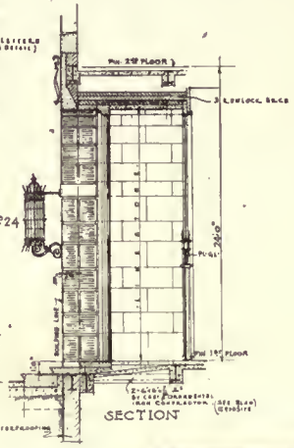


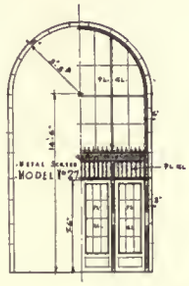
ELEVATIONS



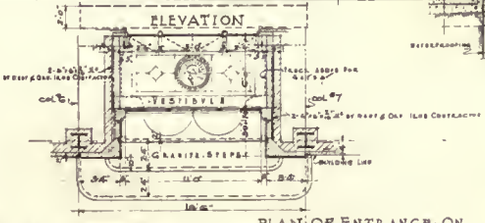
PLAN



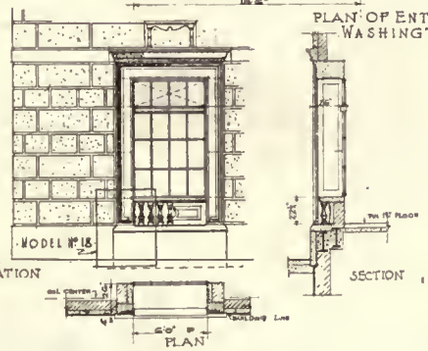




ELEVATION OF INNER VESTIBULE SCREENS (2 LIKE THIS)



PLAN OF ENTRANCE ON WASHINGTON PLACE

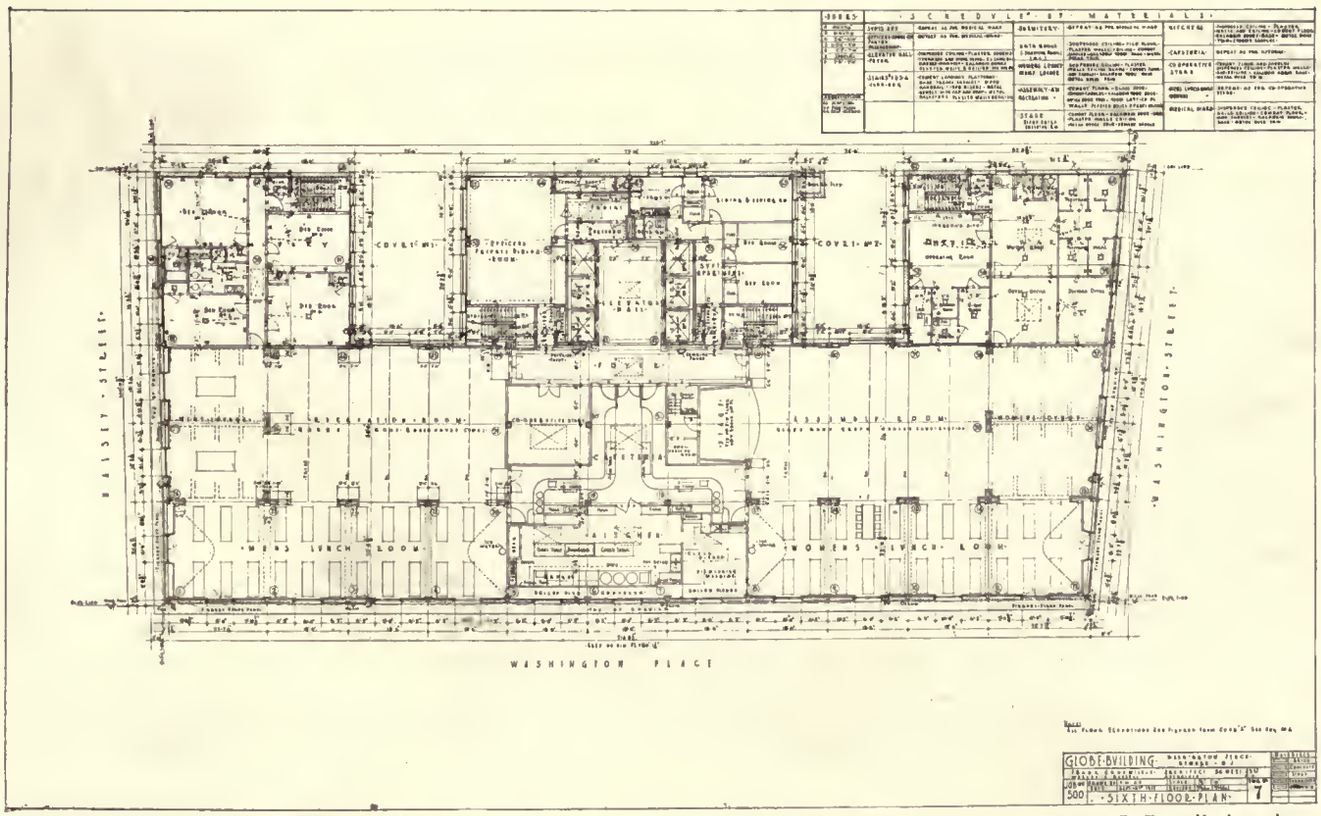


GLOBE BUILDING — WASHINGTON PLACE, NEWARK, N.J.
FRANK GOODWILLIE, ARCHITECT — WESLEY S. BESSELL, ASSOCIATE
500 — STONE & MISCELLANEOUS DETAILS — 15

DETAIL SHEET, ADMINISTRATION BUILDING, GLOBE INDEMNITY CO., NEWARK, N. J.

Frank Goodwillie, Architect. Wesley S. Bessell, Associate.

AUDITORIUM, SIXTH FLOOR.



SIXTH FLOOR (RECREATION FLOOR) AND PLAN. Frank Goodwillie, Architect. Wesley S. Bessell, Associate.

ADMINISTRATION BUILDING, GLOBE INDEMNITY CO., NEWARK, N. J.

The New Administration Building for the Globe Indemnity Company at Newark, New Jersey

SOME one has truly said "big business men are learning that in building a business they are also building lives." "More and more attention is being paid to demands for perfection." "The ideal is always the most practical and most profitable." "An ideal is a perfected idea—an idea from which nothing need be taken away, and to which nothing can be added that will increase its value for the purpose for which it is created." Thus the dream of the president of the Globe Indemnity Company, which started life ten years ago in a twelve-by-eighteen-foot room in the crowded insurance section of down-town New York, has become his "perfected idea," "his ideal."

The personnel of the organization having grown during those ten years from two men to seven hundred men and women, it became necessary to provide a working-place where human energy could be conserved and directed; where the safety, as well as the mental and physical health, of the employees would be fully recognized, and where all influences that could possibly interfere with efficient work were non-existent. The ideal thus required a location away from the crowded and noisy city of New York, where one's home is at a great distance from one's place of business and where transportation is now almost impossible, to the more roomy and quiet city of Newark, where one's home in the near-by suburbs is close to one's place of business.

The site so well chosen to meet the above conditions occupies the entire block front facing Washington Park. The building, which is two hundred and twenty-five feet in length, thus has the greater number of windows with a steady north light, while the east and west windows in the side streets admit the cheery and health-giving sunlight, and so the employees, who spend the best part of the day in this building, enjoy light, sunshine, blue skies, green grass, and trees. Architecturally the building is in the style of the Italian Renaissance, is six stories in height above the street, and has a high, well-lighted basement below the street-level. The exterior has a granite base, with the upper portions in Indiana limestone, carefully selected for its color and texture, and carefully studied with reference to its finish. The building is symmetrical in plan about an axis running north and south, at right angles to the main façade and through the main-entrance corridors, at the south end of which are located the electric elevators, six in number, and running from the basement to the sixth floor.

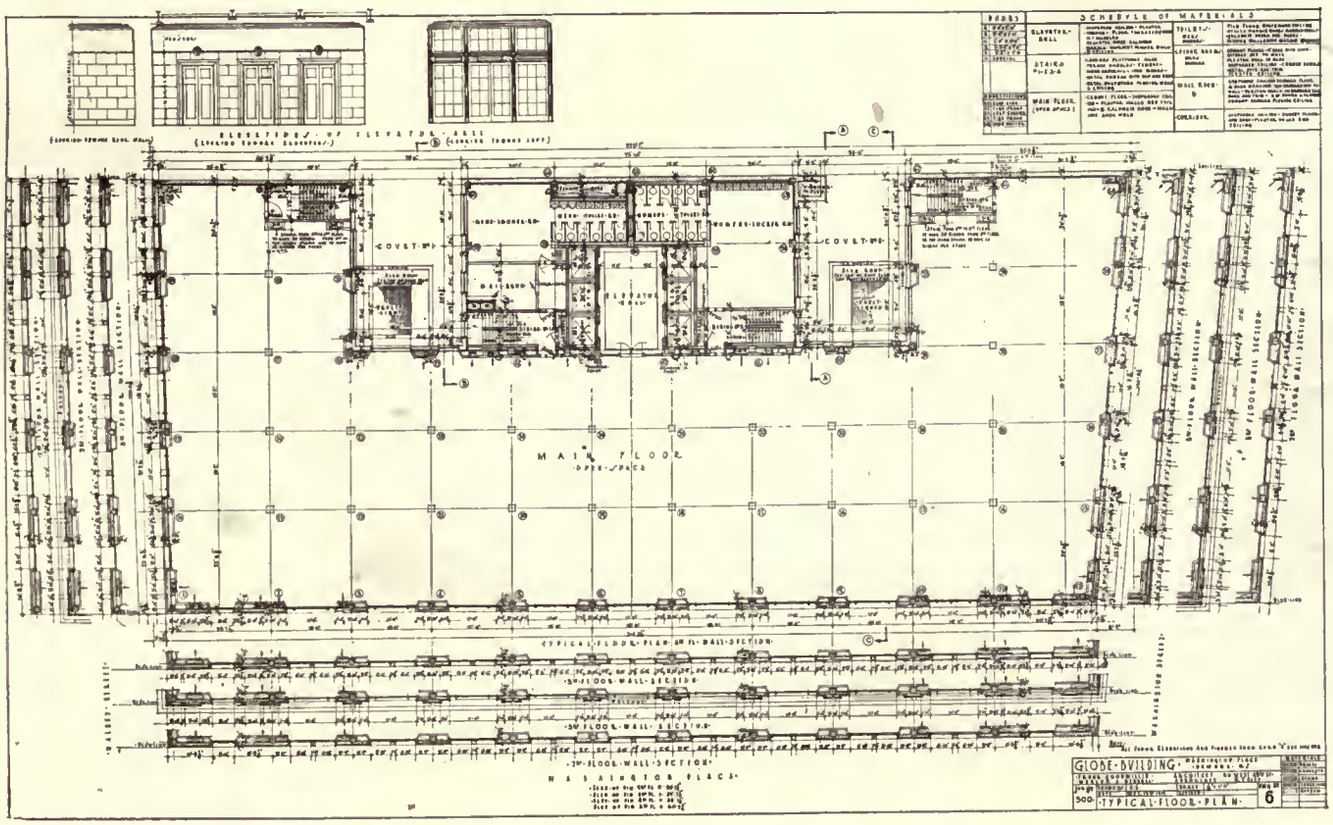
In the basement are located the file, printing, and stock rooms, the boiler, pump, fan, and refrigerating rooms, as well as the electric switchboard and transformer rooms, also a fully equipped butcher and vegetable shop where food is prepared daily for the kitchen on the sixth floor.

The first story, twenty-two feet in height (which allows for the introduction of mezzanine floors, when required), will be occupied later by the executive offices which are now temporarily located on the fifth floor.

The second, third, and fourth floors are laid out in a one-office unit, except that the wings at the rear of the building are separated from the main rooms by sound-proof partitions, and in these wings are located the electrically driven adding, punching, and statistical machines, and the typewriting machines, thus keeping the usual noises away from the business office.

On the fifth floor are located the executive offices—five in number (which later will be moved to the first floor)—the balance of the space being occupied as a business office.

The sixth, or top, floor is devoted to the health and



Typical floor plan

Corner detail, Administration Building, Globe Indemnity Co., Newark, N. J. Frank Goodwillie, Architect. Wesley S. Bessell, Associate.

recreation of the employees; as one enters from the elevator hall you find the cafeteria, one side for men and the other for women, while beyond is the kitchen. Leading from the cafeteria, on either end of the building and at the front, are the lunch-rooms for men and women employees; adjoining each of these lunch-rooms are the recreation-rooms—one for men and the other for women. The women's recreation-room is fitted with a complete stage at one end, and is used as an auditorium, seating approximately six hundred and fifty persons. This room is also equipped with a moving-picture apparatus. There is also a private dining-room for the officers of the company, their guests, and visiting agents.

In one rear wing is located a number of bedrooms, affording accommodations for visiting agents, while in the other wing of the building is a medical and surgical ward, containing rest-rooms for the staff and fully equipped with modern appliances to care for all medical and surgical needs. There is also on this floor a five-room apartment for the superintendent of the building.

The building is lighted by electricity, using a semi-reflecting type of fixture, the walls and ceilings being specially painted to reflect the light but without eye-strain.

The building is heated by a low-pressure vacuum system, using the exhaust steam from the engines which drive the ventilating fans and refrigerating plant for this purpose. All direct radiation, which is placed under each window, is automatically controlled by thermostat.

A complete ventilating system provides fifty cubic feet of fresh, water-washed and warmed, air per minute to each employee.

Locker and wash rooms are provided on each floor, centrally located. All office floors throughout are covered with compressed-cork tile, thus reducing all noise to a minimum.

Each floor is provided with drinking-fountains supplied with ice-water.

A complete refrigerating plant in the basement not only makes ice for table use but supplies the refrigerators in the butcher-shop, cafeteria, and kitchen, as well as delivering iced water to the drinking-fountains.

Opportunity for the Young Architect

THE "Own Your Own Home" expositions should be of especial interest and value for the younger men of the profession, and we note with pleasure the names of several of the well-known young architects among the prize-winners of the recent competitions open to architects all over the country. The competitions in small-house designs have brought forth some interesting examples, and the prize plans are to be sold, with compensation made to the designers for every reproduction. The small house offers an exceptional opportunity for the young architect to show good taste, combined with practical knowledge, and the standards set by these competitions may in time have much to do with the general improvement in our suburban architecture—"a consummation devoutly to be wished." We hope to see that one result of these competitions will be to teach the man in the street to realize that it is to the architect and not to the builder that he must go for good design in small-house construction. A man of training can show his quality as much in a small-house design as in a pretentious dwelling, in fact, his task is often a much harder one.

Oriental Rugs of To-day

By Samuel R. T. Very, Architect

With illustrations of Rugs from Examples in the Metropolitan Museum of Art, New York

ORIENTAL rugs of to-day are not necessarily modern, but neither are antique rugs necessarily ancient. There is a lot of misunderstanding about that. The term "modern" has multifarious meanings. When applied to history, it means that considerable period following the Middle Ages; when applied to plumbing, it means a few decades; when applied to Oriental rugs, it has a variable meaning, but usually about sixty years, the whole period following the adoption of the use of coal-tar dyes by the Oriental rug-weavers.

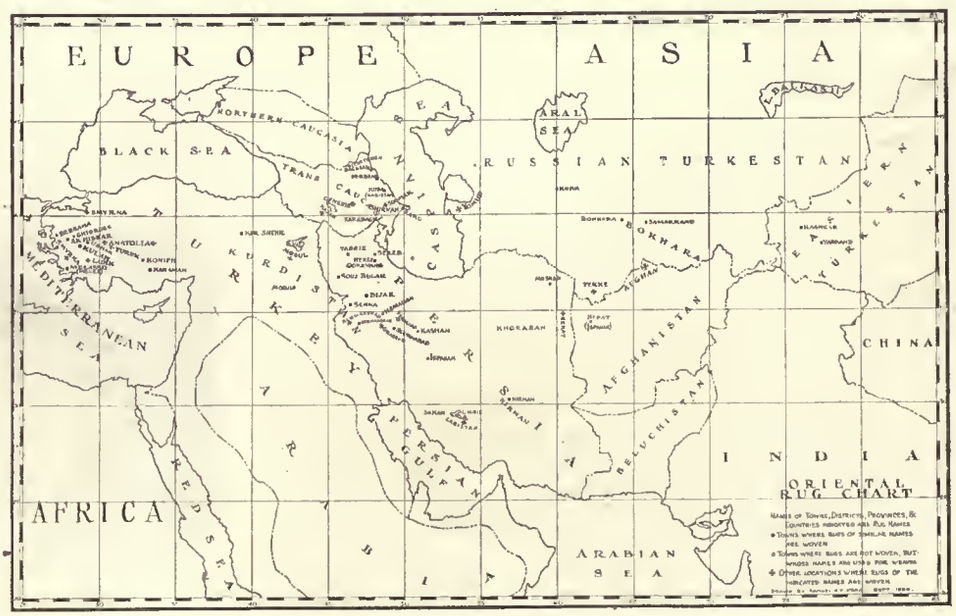
Turkish Ghiordes eighteenth-century prayer rug. Fletcher Collection.

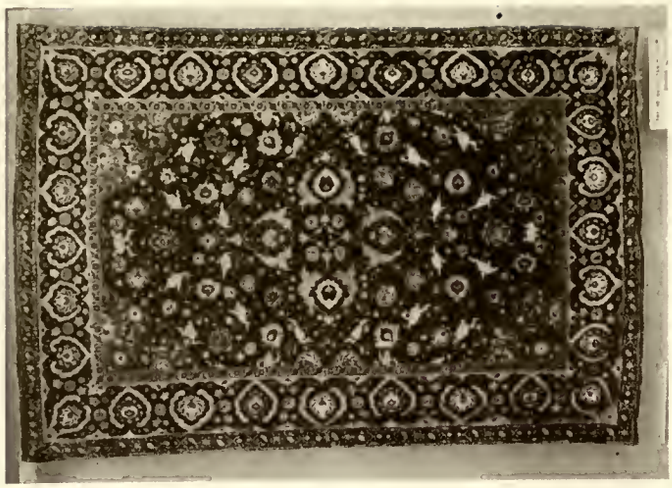
But there are many other factors than dyes which distinguish modern from antique rugs. Influences of travel, conquest, and immigration long ago dissipated the characteristics of weaving, and intermingled the originally distinctive design patterns. Some ancient Oriental rug-making districts have become extinct; others have adopted exotic patterns; still others have been exploited by European capital, and they now weave inferior qualities of rugs, in part by machinery, with piles dyed in fugitive colors. So I do not refer altogether to rug-patterns when I refer to Oriental rugs of to-day. I refer to a multifarious market of antiques, of moderns, made in the Oriental rug-weaving countries and available for sale in the United States.

The divisions of science and art which enter into a complete history of rug origins, materials, weave patterns, dyes, trade names, symbolism, and market values are highly specialized studies. Popular books upon such a technical subject are frequently misleading, and statements in them are sometimes regrettably inaccurate. Dealers are often astonishingly ignorant of elementary facts in the study. Public sources for research are pathetically scarce, and are nearly all uniformly ill-equipped to be helpful.

Charles Darwin spent a lifetime in research before he dared state his conclusions about one of the simplest varieties of pigeons. Darwin was a meticulous investigator, an accurate observer, a cautious and erudite scholar. His evidence was authentic, unquestionable. He was studying a subject popularized for centuries, a variety of bird bred by fanciers of the sport since the beginning of history. Pedigrees were comparatively easy to establish. Records were continuous. Historic allusions were prolific. How then can an art so intricate, so unpopularized, involving many lost sciences, hardly alluded to in contemporary literature, be easily appreciated in its entirety by the amateur writers of to-day who have had almost nothing to guide them except a few statements almost universally written by authorities living to-day, and who are often inspired by fancy, or are misled by "experts" who have an utter disregard for fidelity.

At present there is an import duty of 50 per cent ad valorem on Oriental rugs, but a generation ago they were imported into this country duty free, and many good antiques reached even modest homes, which to-day cannot afford to own them. Some of those pieces are still being released to the trade for re-sale and occasionally to-day can be picked up by lucky buyers at many times their original cost. But genuine antiques are rare, and being much sought after, modern imitations have crept into the market—pieces woven with much of the spirit of their prototypes, and so cleverly treated by chemical and physical means as to make them acceptable to the unsophisticated collector. Dealers have grown diabolical in their cunning and trickery to "antique" their modern weaves. There is as much humbuggery in rugs as there is in antique furniture, but there is





Persian (about 1500). Altman Collection.

so much ignorance of even elementary tricks in this practice that victims are legion.

To-day so-called Oriental rugs, except two principal classes, are those woven in the modern countries of Persia and its contiguous lands, a territory whose area is approximately equivalent to that of the forty-eight States of the United States of America. The exceptions are geniune Chinese rugs and genuine Indian rugs. I say "genuine," for by far the greatest class of commercial weaves manufactured to-day are so-called Indian and Chinese rugs manufactured partly by machinery under European direction.

The Persians learned the art of rug-weaving from the Babylonians many centuries before the Christian era, and ever since then Persia has been pre-eminently the greatest Oriental rug-making country in the world.

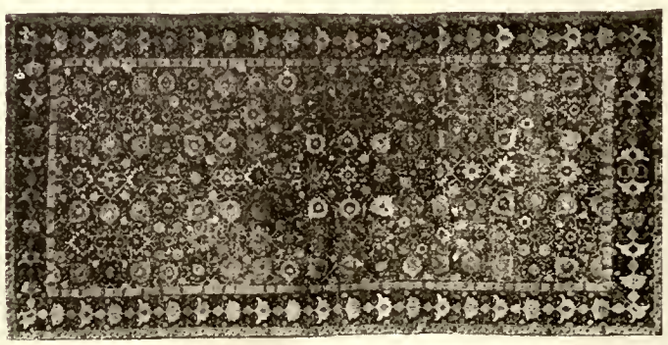
As we know them in the modern market, Oriental rugs are principally of wool, goat's hair, camel's hair, cotton, and silk; but linen, hemp, jute, and other materials are often used, especially in inferior weaves. These materials are woven into the fabrics in three varieties of texture: the so-called "Khilim," "Cashmere," and "pile" weavings. The Khilim and the so-called Cashmere weaves* have no pile, and obtain their design by a variation of the warp and weft threads.

Oriental rugs are woven upon a hand-loom or frame, roughly described as follows: a wooden cross-beam, longer than the finished width of the rug to be woven, is supported in a horizontal position near to the floor in a wooden frame of two uprights, one at each end. Another wooden cross-beam, parallel to the first, makes the fourth side of the frame. Braces, legs, and mechanical adjustments, not materially affecting the art, complete the loom. It is the same to-day as it was in the time of the Shah Jehan. In a vertical direction, from upper to lower cross-beams, are tightly stretched the threads which are called the warp threads. They vary in size, spacing, and materials according to the type of rug to be made, seldom less than fourteen to the inch, or more than eighty. In the pile rugs they are rarely dyed, except at their ends, and then only to give color to the selvedge or finished webbing.

As the majority of Oriental rugs have wool naps, and as the antiques and the moderns were made similarly, a description of the mechanical processes and human operations accomplishing the manufacture of a hand-made, wool-pile rug explains some of the misunderstanding of the art, and discloses at once why antiques are more valuable than moderns, why certain materials are always associated with certain rug classes, why most trade names have sprung up, and why symbolism has lost its former importance. But statements like these should be made with the greatest caution; they can be readily misunderstood. A worn-out antique, badly torn, frayed, and moth-eaten, is not so valuable as a good, well-made, exquisitely designed, vegetable-dyed modern; rug classes cannot be instantly determined with accuracy by a cursory examination of the materials used; many trade names have nothing whatever to do with the processes of manufacture; and symbolism in rugs means what it always did when attention is paid to it *in the weaving*, only, like the signs of the zodiac, the original symbols are to-day rarely ever thought about or used.

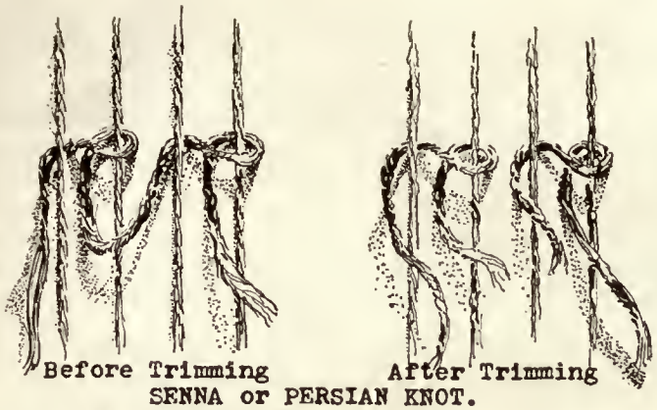
In the days of the antique, long before the weaver could sit cross-legged at the loom, and daily tie three thousand knots of yarn to begin a rug design, there had been already accomplished many patient processes in the manufacture. The wool yarn had been dyed, the undyed yarn had been first spun from wool, the unspun wool had been washed and beaten and prepared for the elaborate processes of dyeing, the wool itself had been clipped from roving animals raised for that purpose for many generations, the dyes had been extracted, aged, and refined from a multitude of vegetable, animal, and mineral sources. None of these processes was an exact science; naturally, then, the human element entered largely into the success of yarn preparation. Whole families were trained from early childhood to prepare it. Children, grandchildren, and great-grandchildren performed identical operations in identical ways, without the least variation, for centuries. They lived in a single community. The wool-bearing animals were indigenous. The mordants and the kermes, buckthorn berries, and indigo, which furnished some of their basic dyes, were gathered at precisely the same state of maturity annually and were extracted and fermented in monotonous repetition. The climatic conditions, the nature of the vegetation, the character of the wool, the habits and traditions of the people engaged in a single rug-weaving district were all special and individual and different from those of any other district. Thus it was that the antiques woven in one district were always characteristic of that locality, and could not be reproduced in any other. Too great emphasis cannot be given to the individuality of the dye-pot uses.

But the dye-pot was only one step of many in the manufacture of an antique rug. The method of the weave was equally individual in each rug-weaving community—a community of related families performing traditional operations in a standard method. If cotton was once the material of the warp threads, cotton remained that material forever. If strong reds and blues and greens and black and white were once the only color shades, they remained so, and they

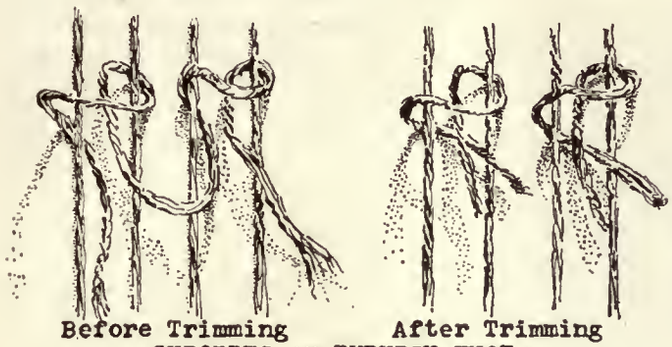


Persian Herat. Seventeenth century. (So-called Ispahan.) Altman Collection.

*The term "Cashmere" is a misnomer; it should be Soumak.



SENNA or PERSIAN KNOT.



GHIORDES or TURKISH KNOT.

were arranged in identical juxtaposition forever. If the senna knot was once tied, it was always tied. The great-grandson of a traveller who had once picked up a pattern he fancied, could duplicate the pattern in the same community but could find it nowhere else. When the Occidental trade in Oriental rugs began, the names of the districts were infallibly exact in designating characteristically individual weaves. But, oddly enough, the resulting trade names were sometimes gross misnomers, as wrong as the popular trade name "hyposulphite of soda," which is chemically very different from its name. For example, the trade name "Ispahan" gives a very precise and beautiful implication to the mind of a rug collector. To a dealer it describes a rug type worth as high as five hundred and fifty dollars per square foot; but these remarkably beautiful rugs were never woven in Ispahan. Indeed, it is a curious fact that the ancient rug names were invariably derived from the modern rug districts, and thus those districts which first released to the trade the only examples of extinct weaves gave their names to the unknown weaves there found. Frequently it is impossible to name with certainty the town or community originating a special type of antique rug; the name of the province or tribe is often as close as possible, and a latitude of at least fifty years must usually be allowed for the age.

The original symbolism of the antique is to-day pretty well lost in modern Oriental rugs. There are many reasons for this. In the first place, the symbolism was a slow outgrowth of the natural restriction of certain colors to certain districts, the rarest colors being reserved for the finest rugs, the finest rugs being reserved for religious uses, and religious fanaticism thereupon ascribing certain mystical meanings to the colors. The symbolism was also due to the traditional conventionalism of various rug types, of design units, and of color, and fashion had a lot to do with it, just as it has to-day. For example, purple is a regal color; it has been associated with royalty since the Phœnicians boiled it from purpura murex; but modern kings do not wear purple silk hats because it is not the fashion. But the scope of the original symbolism of antiques was as nothing to the poetic fancy of a modern Armenian rug dealer. It is obvious that with the great lessening in modern Oriental fanaticism the modern abundance and wealth of color range since the introduction of coal-tar dyes as compared with the original limitations in antique dyes, and since the disappearance of all clues to the origin of much of the original symbolism through the extinction of the families controlling the unrecorded secrets, or from other sufficient causes, added to the fraud of the many unscrupulous and ignorant dealers, as well as the eager gullibility of rug buyers, rug symbolism is no longer an exact science, even if it ever was.

I have marvelled at the naïve gullibility of many otherwise intelligent rug owners who have shown me their often commonplace rugs and quoted wandering, ignorant Syrians or imaginative Armenian rug dealers to establish the alleged date, place, and name of the weave and weaver, and who have developed whole novels out of a picture of a horse woven in with very little or no artistic merit and certainly less symbolic intent. I have never met any one who knew anything about rugs who has seen the date or place of manufacture, or the weaver's name in any genuine antique, or read of any authentic instance of such records, although, of course, many modern "doctored" pieces contain dates purporting to be the year of manufacture according to the Mussulman calendar. Antiques and moderns alike frequently contain inscriptions, but they have nothing to do with symbolism.

With the exception of the rugs woven in part by machinery, as, for example, a great many "Indian" rugs reaching the United States, all of the Oriental pile rugs of to-day are made in precisely the same way. The weaver sits at the loom which has been already described, as primitive to-day as it was centuries ago. The pile yarn, already dyed, is cut in a short piece and tied around the warp threads four at a time, in one of two different characteristic ways—invariably called "knots" by rug writers—the Ghiordes knot and the Senna knot. "Loops" would be a better description, for the knots are retained in place merely by the tightness of the weave, the pressing of other "knots" against them, the spreading of the wool yarn at the free ends, after cutting, and the interlacing of successive rows of weft threads, after successive rows of pile loops. The weft weave is pressed tightly down to the pile threads by an instrument called a "comb." This is many-pronged, long-toothed, and designed to penetrate the interstices of the warp threads and press down the yarn. It is not at all like a hair comb; it is more like the base of a barber's clipper; indeed, I have seen such an instrument used for the purpose, but the fanciful writers of Oriental rugs sometimes affect to see a mysterious symbolism of obscure and poetic origin in the primitive pictures of this "comb" woven into some of the antique weaves and many of the moderns. " 'Cleanliness,' " they write, " 'is next to Godliness,' thus saith the Koran; hence the origin of the comb unit in many rug designs." Unskilful pressing down of the weft or cross-threads produces unevenness or irregularity in the finished specimen. There is no greater fallacy than the popular belief that such unevenness in rugs is a valuable characteristic. But I have heard dealers go so far as to point out unevenness as an especial element of extraordinary value in bad specimens of common types of modern rugs.

The rug design in pile rugs is obtained by varying the colors of the pile, or nap, or loop yarn used to tie the different knots, except at the selvage, where the warp and weft

threads themselves are colored and woven into designs, as in the case of the Khilim rugs. The design in "Cashmere" types is obtained by the stitch-yarn colors, as well as by the body weave. A chart, called a "talim," is placed in front of the weavers. This is a small portion of a finished rug similar to the part being woven. This chart is accurately tied, with just the right number of knots, each colored properly. A high degree of skill is required to follow one of these charts, for it is no uncommon pattern which has five hundred knots to each square inch (coarse patterns have eighty), and in some of the finest weaves there are a full thousand. Modern rug factories utilize unskilled weavers by giving the talim to a supervisor who, seated in front of several weavers, drones out the weave instructions, knot by knot. A really skilful weaver can tie from four to six knots a minute, which amounts to from six square inches of a fine weave up to fifty square inches of a coarse weave of rug per day.

Animal design on dark-red wool. Indian. Late sixteenth-seventeenth century.

At the modern loom are seated those wretched pariahs who toil from the age of four or five years old, from sunrise to sunset, week after week, usually unpaid for the first two years, and thereafter paid but a pittance. The weavers are usually girls and women. They work independently at different looms upon the smaller rugs, and jointly as many as six together, upon the wider pieces. Rugs woven in the United States, by hand, in a similar way, would cost to-day at modern wages approximately twenty-five to fifty times the current costs of even the better classes of imported Oriental rugs. In the latter half of 1917 undyed woollen yarn sold in New York for as much per pound as I have sometimes paid per pound for a very good quality of hand-tied, vegetable-dyed, antique Karabagh type of imported Oriental rug.

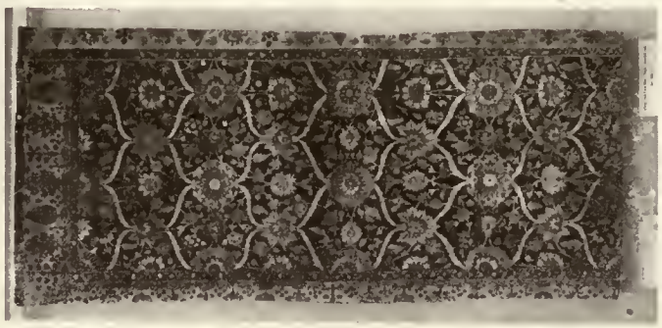
After two rows of the knots are tied and fastened by the weft threads in most weaves of pile rugs, the loose, more or less uneven ends of the yarn, and the middle bight between each double pair of warp threads, are cut off with scissors to the intended length of pile in the finished rug. This cutting is always very difficult; the greatest skill is required in short-nap rugs like the Senna. It is impossible to wait until the whole rug is finished to do this cutting, although statements to that effect can be found in print. Moreover, modern pieces are not trimmed differently in that respect from antiques; scissors, not knives, are used to trim the pile.

The designs themselves, the rug patterns, have well been called the "souls" of the Oriental weavers, for the best antique designs have lived and increased in beauty in the ages since their originators died. Unfortunately, to-day in the modern market but few of the original design types have survived to the trade, but once in a while one can still stumble across a household containing a forgotten specimen. Indeed, through the commercialism of the industry, through the extinction of many of the original rug-weaving districts, through the corruption of pattern individuality by exotic influence, the number of original design types in all the Oriental rug-weaving countries known to the local trade has dwindled to less than sixty patterns, of which about thirty types are Persian. But numerous arrangements of designs and color units permit an almost limitless multiplication. There are innumerable unlike rugs in the markets of to-day. Occidental exploitation of the manufacture has even introduced western motifs into Turkey and India especially, and some of their products (not by any means all) are more vicious to the eye than even their domestic prototypes.

The use of coal-tar dyes has revolutionized the industry. Many gradients and shades and color mixtures immediately became possible, hitherto unfound in rug-yarn colors. The laborious and difficult processes of dye extraction, treasured in secret by generations of the Oriental dyers, were pretty generally discarded for the quicker, surer, cheaper European product of the organic chemist. Drastic local laws were no preventive. Years ago the Shah of Persia proclaimed an edict forbidding the employment of aniline dyes for weaving purposes throughout the kingdom, with the stipulation that violators should have their right hands cut off. Judging from the Persian rugs imported to-day, the law has been universally evaded. There has been much nonsense stated and written about the fugitive quality of aniline dyes. Coal-tar dyes are or can be as fast as vegetable dyes, faster in some respects. Some coal-tar dyes are fast; some are not. Some are fast to washing in cold water, some to washing in hot water, some to daylight, some to artificial light, some to heat, some to pure soaps, some to impure soaps, some to all these actions and many more; but none are fast to sunlight in the absolute sense. But just there is where there is the greatest misunderstanding; the ancient dyes from vegetable, mineral, and insect origins as known and used in Oriental rug-making are no faster to sunlight than are the best grades of modern coal-tar dyes. Moreover, some of the dyes were not fast in the sense that the wool appeared the same forever. I have many times seen artificial blacks gone utterly, so that the antique specimen looked moth-eaten in those places where black nap was used. Cheap, fugitive coal-tar dyes, however, have often been palmed off upon the unsuspecting Oriental weaver, and it is not at all uncommon to find in the modern market rugs whose whole designs are different than when finished, through the fading or changing of the colors. Yarn dyed with some inferior coal-tar products sometimes fades to an actually different color; it is frequently possible to examine the roots of an inferior pile rug and find quite different colors than those exposed to light. But it must not be misunderstood that fading, as is generally supposed, is detrimental to a rug; there is not an antique in existence whose value has not increased through the fading of the originally garish colors. Fading is essential in rugs dyed from the ancient dyes, to secure the desired color harmony; but fading is undesirable in any rug when, as is commonly done to-day, it is accomplished artificially, through the use of acids which destroy the "life" of the yarn; and fading is usually undesirable in rugs dyed with coal-tar colors.

In an article as brief as this it is impossible to explain the characteristics of the rug types handled by the trade to-day. Indeed, it is a meticulous investigation, often fruit-

less, to classify with certainty some of the rugs of modern manufacture; and it is much more difficult to determine the age or district of manufacture of many of the older pieces. Authorities greatly disagree. Proofs are not so readily obtainable as in the identification of old paintings. There are hundreds and thousands of unlike rugs in the modern market, but there are only about fifty different rug varieties, called by a multitude of different names. One of these names is "Iran." It is a name frequently used by modern market rug dealers, especially Armenians. It seems to be applied to rugs of both the Ghiordes and the Senna knot and to rugs of every sort of design and pattern weave. It sounds well to a buyer; it is very strange, very foreign, very knowing; who would not buy a "genuine Iran" rug?



India. Imperial manufacture. 1600-1580.

It is pronounced Ear-ran. But the term means merely "Persian." Its general use attests the difficulty of classification.

But there are certain characteristics of importance which make infallible a classification of genuine Oriental rugs into five main divisions: Turkish rugs, Persian rugs, Baluchistan rugs, Caucasian rugs, and Turkoman rugs, the only Oriental rugs of to-day except the commercial Asia Minor rugs and Indian rugs, the genuine Indian rugs, the genuine Chinese rugs, the nondescripts, and a miscellaneous but infrequent scattering of weaves originating around the perimeter of the principal rug-weaving countries.

But the classification of Oriental rugs is another matter.

The Human Element in Architecture

By Walter W. Cook

Of Lockwood, Greene & Co., Engineers, Architectural Department, Boston.

ARCHITECTURE has been referred to as "Frozen Music." I think that applies to design and ornamentation. To my mind architecture is more human. I feel that all buildings can be classified somewhat as are individuals. The building which expresses the individual use and arrangement best is the better building.

How can we arrive at that result? None of our buildings do so a hundred per cent. It is only by striving continually to approach perfection that it will ever be accomplished. An architect must not be held personally responsible for inability to do this, as the owner or client must be of the same mind if it is to be done. It is the architect's work to try and bring this about. In this age of commercialism dollars and cents play such an important part that idealism is apt to be brushed aside—justly so in a great many cases.

The people themselves have been expressed in the architecture of the past and, to my mind, this will always be the case. In a cosmopolitan country like America it will be a long time before any national style will be developed. Architecture is like a language, and it is as difficult to invent new forms and new designs as it is to invent a new word or to force Esperanto on the world.

In brief, the people of any community must be united to produce a lasting or an individual style such as the Greek simplicity, the strong Roman period, Italian Renaissance and later French and English Renaissance periods.

New materials, such as steel and the modern use of reinforced concrete, have developed a new kind of structure but we continue to clothe these structures with the forms and ornaments of earlier periods.

> "In all new work that would look forth
> To more than antiquarian worth,
> Palladio's pediments and bases,
> Or something such, will find their places."
>
> —*Clough.*

Architects who best adapt the real work of the past to our modern structures will produce the best results, and the forms that are used must express the character and the use of the building to best advantage.

Architects must, to my mind, sit down with the owner and talk dollars and cents at the start and determine what the client is willing to spend for exterior treatment of his building—especially for commercial buildings. At the same sitting Mr. Architect must set forth the facts which are becoming more evident every day, that the proper exterior treatment of any building is worth dollars and cents to a client for advertising value as well as the morale of his business. There is no doubt as to the value to the owner of a good-looking, well-kept manufacturing plant. The architect must obtain effects with the simplest and most economical of treatments that will best express the use of the building. To illustrate: it would be folly to put a Greek-temple front on a power plant.

Excellent results are obtained by the simplest of treatments, combining good proportion with proper scale; but the plan and use of the building comes first, and if this has been studied so that the plant works out to its very best advantage, the elevation will take care of itself and is bound to express outwardly that which is going on within.

GARFIELD OFFICE.

EDGEWOOD OFFICE.

Smith, Hinchman & Grylls, Architects.

BRANCH OFFICES, DETROIT TELEPHONE CO., DETROIT, MICH.

WABASH OFFICE.

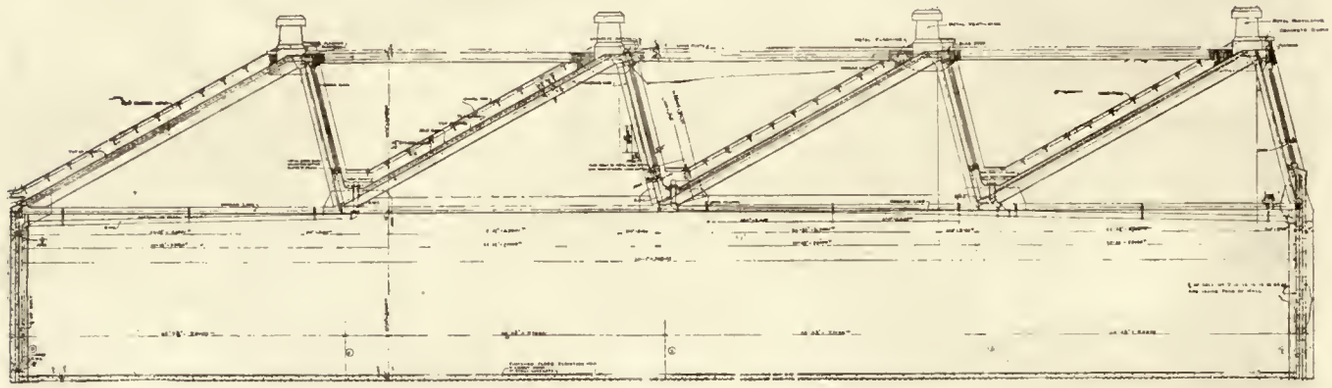
LINCOLN OFFICE. Smith, Hinchman & Grylls, Architects.

BRANCH OFFICES, DETROIT TELEPHONE CO., DETROIT, MICH.

The Super-Span Saw-Tooth Roof Construction

An Improved Form of Saw-Tooth Roof Construction Which Gives Ample Light and Unobstructed Floor Space

By W. Ellis Groben



WITH the increased present-day cost of construction it has become imperative to obtain the maximum area for productive purposes of all types of industrial buildings. The maximum manufacturing area, together with the greatest possible amount of daylight in a given limited space, is the demand made upon architects and engineers by industrial managers.

With this object in view, the Ballinger Company, architects and engineers, Philadelphia and New York, have developed the so-called "super-span saw-tooth" type of construction for buildings of one story, and for the top floor of a building of more than one story, in which every square inch of floor space is made usable in buildings of any desired length and having a width of 100 feet or less.

This is accomplished by using trusses to span the width, thereby avoiding any supporting columns and their consequent shadow spots and cross shadows. With no supporting columns, it then becomes possible to arrange the machinery in the most advantageous manner to suit any particular industrial process.

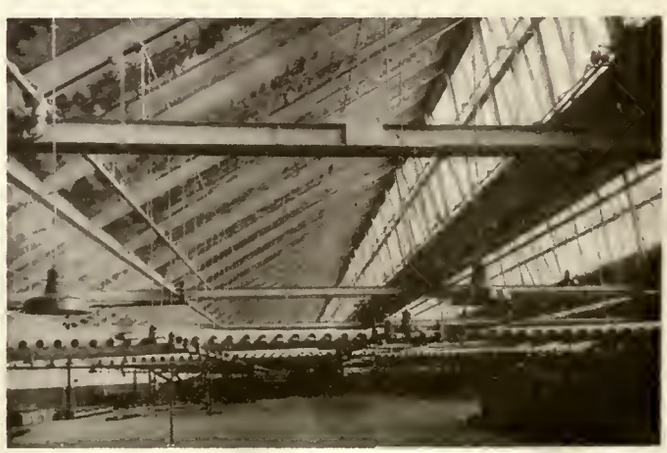
With the saw-tooth skylight even distribution and uniformity of daylight are obtained throughout the building, regardless of its size. It has been found that skylights give sufficient light for many industrial purposes, no windows being required in side walls. Consequently, the surfaces of these walls are made available for other uses, and in such instances it is entirely possible to erect any number of super-span buildings side by side, thereby securing the maximum use of the property, since no interior courts are needed.

The interior of the Guaranty Silk Corporation's plant at Nanticoke, Pennsylvania, gives an excellent idea of the uninterrupted floor area and its uniform lighting where no windows have been placed in the side walls. The span in this instance is 102 feet and the length of the building 353 feet. In this particular building it has been possible to place 17 per cent more looms than if the old form of construction had been used, involving upright supports.

For buildings more than 100 feet wide and of any length, where a number of super-spans are used side by side, no intermediate masonry walls are required. In their place a supporting column is located only where the super-span trusses meet, so that no supporting columns are needed for units of floor areas of 6,000 to 8,000 square feet.

By a slight modification in the construction the saw-tooth skylights may be placed either lengthwise or crosswise, as required, to face the north light. The bottoms of the trusses may be designed to carry jacquards for weaving, trolley hoists for erecting purposes, motors, blowers, shafting, radiators, and ducts. This location has been found advantageous for radiators, because in localities where cold weather is encountered the heat from the radiators prevents freezing in the gutters.

Those who have had practical experience in the management of textile factories, industrial plants, machine-shops, etc., readily visualize the tremendous advantages of this style of construction for such purposes, as compared with buildings having supporting columns.



Automatic Control of Humidity in Shops

DEVICES for controlling humidity in shops are of three types. The first are makeshifts, such as wet sawdust strewn on the floor, troughs of running water at the sides of the room, or simply an ordinary sprinkling-can. Such crude devices are not in any sense self-regulating, and even with the most careful personal attention produce only haphazard results. The sprinkling-can type of humidifier has been in use for hundreds of years and is of interest chiefly because it shows that the need for air-conditioning apparatus in many industrial plants has been recognized for a long time. A second class of humidifiers includes those that are capable of increasing the moisture in the air up to the point for which they are set, but cannot decrease it. When the weather forces the humidity above the desired point such instruments remain inactive. Few instruments of this type attempt any control of the temperature. A third type of conditioning apparatus is that which is able to hold the atmosphere in a room at a constant temperature and humidity irrespective of outside conditions.

One of the few instruments which absolutely control both the temperature and the humidity of the air is that developed at the Forest Products Laboratory, Madison, Wisconsin. For several years this apparatus has maintained in the laboratory wood-parts storage rooms the typical climatic conditions found in various parts of the United States, ranging from the hot, moist climate of the South to the cold, dry climate found in the mountain regions. The same type of instrument also keeps the wood-working rooms at the laboratory at uniform temperature and humidity year in and year out, with the result that the wooden articles manufactured there give the minimum amount of trouble afterward from warping and checking, and the shop conditions are healthful and comfortable to the highest degree. These instruments have required very little personal attention since they were installed.

The principle upon which the laboratory automatic humidity-control apparatus works is that of cooling the air to the dew-point temperature for the desired atmospheric condition, saturating it with mositure at that point, and then heating it without addition of moisture to the required room temperature. For any given room temperature it is possible to get any humidity desired, simply by choosing the temperature at which the air is saturated.

The apparatus consists of a small cabinet, or chamber, through which the air is drawn as often as it needs to be conditioned. The conditioning chamber contains water sprays whose temperature is kept constant by a mixing-valve. These sprays suck in the air by their own action, cool it to the temperature at which it should be saturated, and give it all the moisture it can hold. As the air leaves the chamber it is heated to room temperature by coils, whose steam supply is controlled by a thermostat located in the outlet. Thus when the air is drawn into the chamber it may be too hot or too cold, too moist or too dry, but the apparatus automatically humidifies or dehumidifies it and brings it to the correct temperature before allowing it to pass again into the room. Both in the storage rooms, where the air needs conditioning very infrequently, and in the workrooms, where it is completely changed every ten minutes, the recording instruments show that the atmospheric conditions have varied to only a slight extent throughout a three-year period.

This method of air conditioning was developed primarily for woodworking shops and wood-gluing, finishing, and drying rooms. It is adaptable, however, to numerous other industrial plants, including textile mills and chemical, foodstuff and tobacco factories, in which close control of atmospheric conditions would be beneficial to both the material being manufactured and the health of the employees. It is practicable wherever there is a supply of cold water and steam heat.

Drawings of the apparatus and further details concerning its installation and operation may be had on application to the Forest Products Laboratory.

Build the New House with Adequate Electrical Outlets

LUXURIES of a few years ago have become necessary equipment in the well-planned home of to-day. The modern home, no matter how small or how modest it may be, is now equipped with many up-to-date features that make it a better place to live in.

Scientific housekeeping is made possible by the use of well-known labor-saving devices, which have been developed so rapidly in the past few years that they have not only come within reach of every home of moderate means but have actually reduced operating costs.

One of the most important points to consider in planning the successful home is adequate electric wiring, with a sufficient number of properly placed outlets.

Good lighting means more than illumination without the aid of a match—carefully selected and well-placed lamps and fixtures make the home more attractive and add greatly to its comfort. Properly located switches eliminate searching in the dark for lights, and a number of extra outlets permit the use of labor-saving appliances without loss of time or disturbing the lighting arrangement.

The vacuum cleaner, electric iron, washing-machine, table appliances, and many other electric household conveniences are now considered as necessary as water or light in the up-to-date home, and, intelligent provision for their use is as essential as modern plumbing.

Vocational Education

THE Fifteenth Annual Convention of the National Society for Vocational Education will be held at Kansas City, Mo., January 5, 6, 7, 1922. This meeting will be attended by representatives from every State in the Union and Canada. At the meeting this year one of the special features will be an exhibition of vocational building plans. At the present time there is wide-spread interest throughout the country in buildings adapted to vocational-education purposes. The exhibition at Kansas City will consist of blueprints of the floor plans and elevations, together with data in regard to cost, type of construction, date of erection, number of pupils the buildings are planned to accommodate, and also photographs showing the principal features of the buildings. This type of work is relatively new in America and to-day there are but few buildings that have been planned specifically for this purpose.

The growth of vocational education in this country has been very rapid during the past three or four years. In 1916 there were only two or three hundred vocational schools in operation in the United States. To-day there are over four thousand schools or departments throughout the country. I am reasonably sure that during the next five years hundreds of buildings will be erected for this purpose, and in addition special provisions for this type of work will be made in a great many regular high-school buildings.

The Emerson Record Shop

W. K. Pleuthner, Architect

Detail.

THE design for the Emerson shop passed through several stages. First: the purely imaginative, which searched the past for a precedent regarding an environment of music, some kind of musical atmosphere which was expressive of a period with some relationship to the present day. The thought presented itself and pictured the old English carol environment, with its informality and spontaneity—a spirit of music. Acting on this there came to mind old plaster, leaded glass, and quaint touches, associated with the early English periods. This spirit, with its robust treatment, also gave possibilities of keeping a slight feeling of out-of-doors in the galleries.

The programme of arrangement in plan and design was as follows:

The building was remodelled, first floor narrow, especially at the entrance, with a splayed and irregular side. Great elasticity gave symmetry to the plan. This was secured by a series of rooms which made for better proportion than one or two long, narrow and high. Small floor area necessitated a scheme which would expedite circulation. The three phases of business in this scheme were, first: the active buyer who wished to purchase a record quickly—a quick beat to the measure; second, the prospective purchaser of several records; thirdly, the lingering purchaser of a phonograph and accessories. The time consumed by these three classes was timed, and the facilities of the record stack and booths were arranged to see this through as expeditiously as possible. The stair gallery and display room were treated and placed for a more leisurely sales attitude.

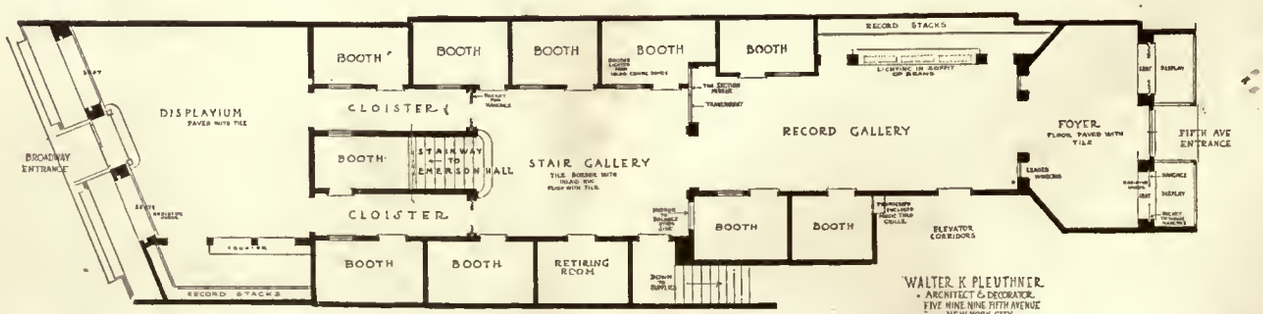
The choice of a scheme of color was dictated by the structure, scale, and artificial lighting necessary in the stair gallery. The stair gallery is the climax of the scheme, from an architectural, picturesque, sales, and color standpoint. The progression of the two galleries to the stairway is the progression one should feel in a series of rooms. There must not be a too sudden transition between the out-of-doors and the intimate place where color, sentiment, and comfort prevail. The foyer having a great deal of natural light, facing the east, can carry comfortably a cool color. The galleries, being small, necessitated a predominating tone which should give them breadth and atmosphere. Atmosphere is another term for tone. Thus the scheme has a melting tonality which is conducive to a musical cadence. A basic undertone was laid on of old ivory. The dark glazing of low-toned purple, a rich amber and a mellow-toned green give one a gamut of color well controlled and in keeping with the architonic melody of the structure. The soffit and ceiling illuminating was determined upon in the foyer gallery and booths because of their miniature size. The free hanging fixtures were also designed by the architect, Mr. Pleuthner, who is a craftsman and painter interested in the actual execution of the material. The escutcheon of the hardware on the doors is adapted from the insignia of the Emerson Company.

Displayium.

The leaded glass embodies motifs suggestive of the company's products, while the architect signed his work in lead.

The stairway invites one to Emerson Hall on the second floor, where concerts are contemplated.

The Emerson Record Shop might be termed cosmopolitan in style, American in atmosphere, modern in scope. Having a modern product to sell, therefore, æsthetically it should have a modern environment—material used of a variety that is compatible with the cosmopolitan style.



PLAN OF TWO-NOUGHT-SIX FIFTH AVENUE
EMERSON RECORDS
SALES-CO.

STAIR GALLERY.

RECORD GALLERY. W. K. Pleuthner, Architect.

THE EMERSON RECORD SHOP, NEW YORK.

Announcements

The following letter seemed of such interest that we asked the writer's permission to pass it on.

PARIS, FRANCE, September, 1921.

DEAR MR. EDITOR:

This is rather a belated letter in regard to the exhibition by the architects of America, under the auspices of the A. I. A., at the Grand Palace in Paris. There is no doubt that an exhibition of this sort should be had every year, not only in Paris but in London, and God knows they need the uplift which American contemporaneous architecture can give them. It is unfortunate, however, that our exhibition was so hurriedly gotten together. We had no catalogue, and the halls were painted with colonial work from Annapolis, Boston, and other places. This rather surprised the Frenchmen, as they expected to find an exhibition showing what the American architects were doing in the present time. There were no plans shown, and this made it difficult for the Frenchmen to comprehend the photographs. I believe further that if the institution would take this matter up earlier and provide an exhibition of American architecture in exchange for one from Paris as well as one from London, we would all benefit from it. It seems that a greater part of the European architecture of to-day is rather mushy and decadent, whereas most of ours to-day shows itself full of character and purpose.

Jacques Greber, who is laying out Fairmont Park in Philadelphia, had a most wonderful collection of drawings, apparently regardless of expense, for which he received a gold medal.

I am further interested in the method of labelling the arts employed in this exhibition. Formerly we used the expression "architecture, sculpture, and painting," whereas in this case we have "sculpture, painting, and architecture." There seems to be a subtle reason for this which explains itself.

I myself found five thousand names of painters, very nearly as many sculptors, not many French architects, a smaller number than those among the Americans. I believe that if the architects in America would take this matter seriously they might possibly regain their former supremacy.

I am enjoying myself here immensely and expect to remain for a long time.

Very sincerely,

FRANK E. WALLIS.

Mr. A. D. R. Sullivant, formerly associate member of the firm of Hoppin & Koen, and Mr. Frederick M. Godwin wish to announce that they have formed a partnership for the practice of architecture under the name of Godwin & Sullivant, with offices at 350 Madison Avenue, New York.

Elwin P. Norberg, architect, announces the opening of an office for the practice of architecture at 6403 Hollywood Building, Los Angeles, Calif. Manufacturers' samples and catalogues are requested.

Robert L. Harris, architect, announces the removal of his offices from the Calvert Building to 13 West Saratoga Street, Baltimore, where he would be pleased to receive catalogues and literature.

Cram & Ferguson, architects, announce the removal of their offices from 15 Beacon Street to 248 Boylston Street, Boston, Mass., November 1, 1921.

Baker, Smith & Company, who installed the heating and ventilating equipment in the Harkness Memorial Quadrangle at New Haven, Conn., have called our attention to an error in the preparation of their advertisement that appeared in the October issue that credited them with the power-plant.

We regret the error and call attention to this universally known firm's announcement in this number.

Redfield & Fisher, Inc., announces that on October 15, 1921, Mr. George N. Wallace, formerly a director of Hoyt's Service, Inc., in charge of Copy Department, becomes associated with this advertising agency, which will hereafter be known as Redfield, Fisher & Wallace, Inc., 105 West 40th Street, New York.

The New or Conduo-Base Method.—The new or Conduo way of wiring, manufactured by The Dahlstrom Metallic Door Co., Jamestown, N. Y., eliminates both time and trouble.

Why? Briefly, the Conduo-Base carries the wires for the office. When a change is necessary, it only requires taking off the face of the base, selecting the wire required, making a notch in the face for the receptacle, making the connection, and replacing the face.

It is not only quicker, but neater, and is accomplished with less confusion and noise than is required under the old method. It does not leave the unsightly mars on the walls and ceilings, and wires are not strung around the mouldings in the rooms to become fire hazards.

Conduo-Base is metal and thereby provides an additional fire preventive for the building. It is sanitary, and the bronze floor moulding which is provided will not rust or deteriorate. It is furnished in natural bronze, so there is no finish to wear off. The face and other outside members are finished either in plain or stippled colors or grained to perfectly match any wood finish.

It has also been noted that where marble and other mineral substances used for base-boards come in contact with radiator steam and heat, they quickly crack and corrode, leaving unsightly, unsanitary cracks. Conduo-Base, being all metal, overcomes this trouble.

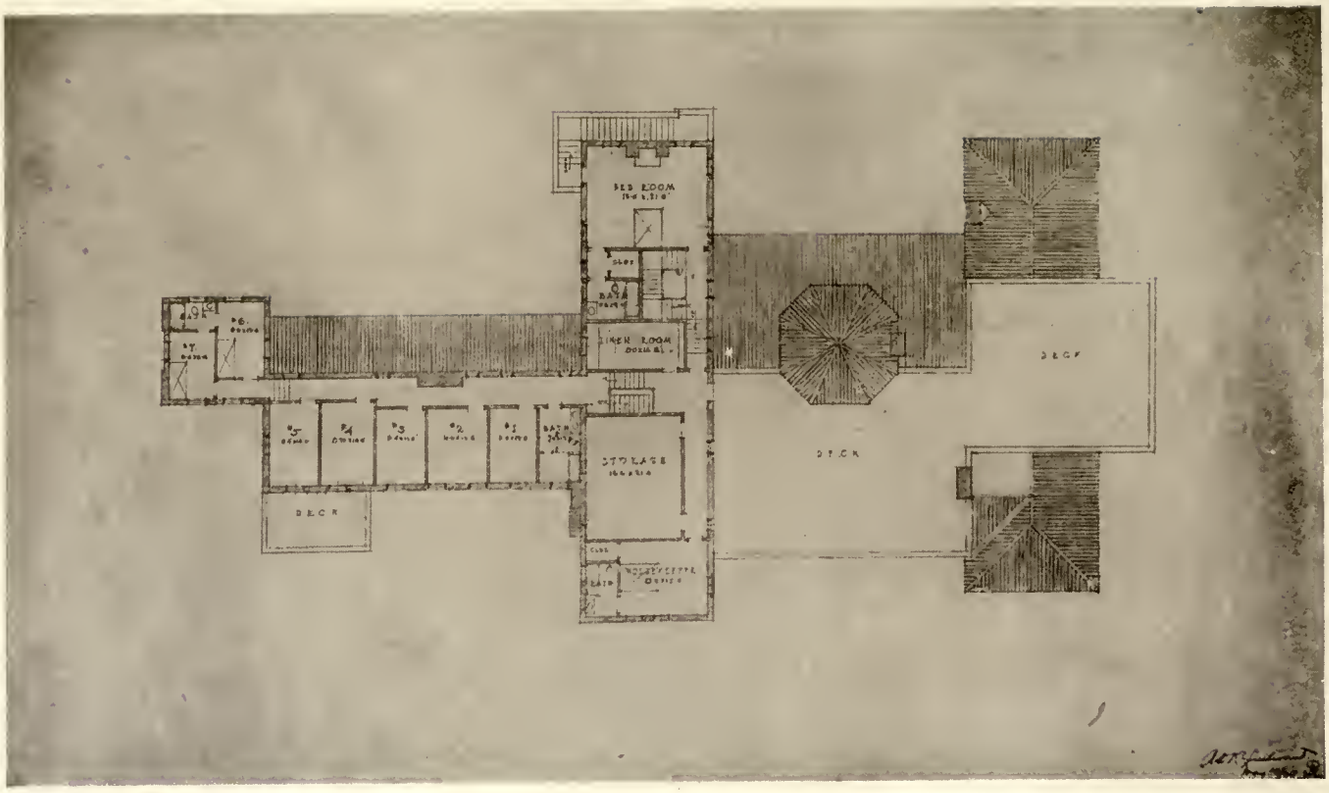
Thomas S. McLaughlin, architect, announces the opening of his new offices in rooms 409 and 410, 72 Weybosset Street, Providence, R. I. He is a member of the American Institute of Architects.

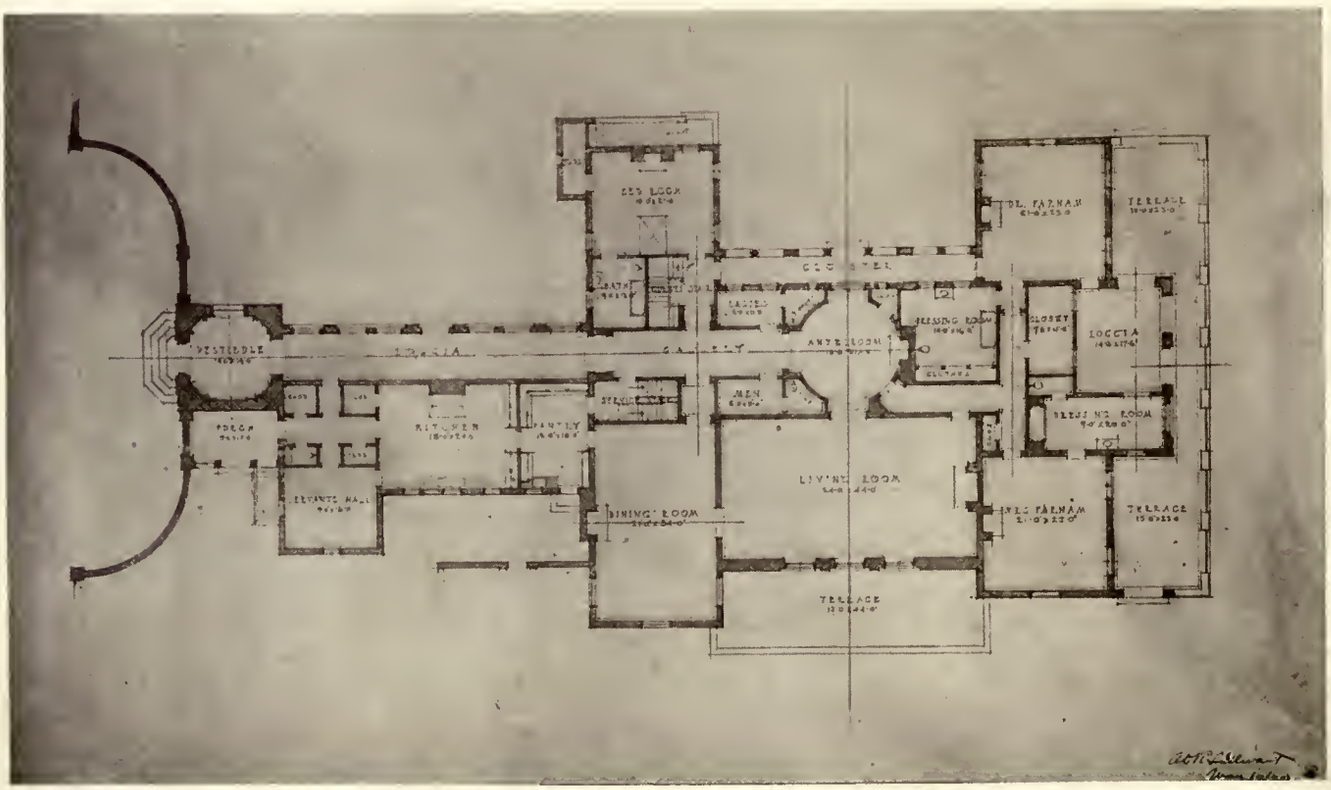
Theodore F. Laist, formerly Major of Engineers, U. S. A., Construction Division, announces that he has resigned as architect, Central District, Bureau of Valuation, Interstate Commerce Commission, to become Chicago representative of the National Lumber Manufacturers' Association, 1613 Harris Trust Building, 111 West Monroe Street, Chicago, October 1, 1921.

Warren & Clark, architects, have taken temporary quarters at 15–17 West 44th Street, New York, until their new offices are completed.

SKETCHES FOR RESIDENCE IN CALIFORNIA.

A. D. R. Sullivant, Architect.





SKETCHES FOR RESIDENCE IN CALIFORNIA. A. D. R. Sullivant, Architect.

Construction of the Small House

By H. Vandervoort Walsh
Instructor, School of Architecture, Columbia University, New York

ARTICLE XIV

SELECTING MATERIALS FROM ADVERTISEMENTS

IN the planning of the construction of the small house, the architect has many problems of selection, such as the choosing of this brand of roofing material from among many makes or the specifying of this type of furnace from among many patterns, and, in fact, the selection of the best type and the best materials which the market affords in all branches of structural and mechanical devices. If he does not specify any one brand, but merely states that the contractor shall use an approved make of paint or an accepta-

ble brand of hydrated lime, he has merely deferred his ultimate choice in the matter to a later date, for in the end he must decide whether the particular make or brand is acceptable, and in order to do this he must know enough about the various makes and brands on the market to judge wisely and in a fair spirit, for the chief motive in back of the contractor's choice will be rather one of money than quality.

The problem, therefore, which confronts the architect in acting as judge of materials and brands as to their quality is very serious and extremely full of pitfalls, and outside of his personal experience and that of his friends, the choice must be made upon the claims of the manufacturers as presented in advertisements. Now, of course, the difficulties which advertising literature presents are the overstatements which are found in them and the suppression of facts which appear to the makers as derogatory of their product. But if the circulars of information and advertising statements are collected for any one type of mechanism or any one type of material or system of construction, it will be found that the truth of the matter will be implanted in the accumulated statements of the various concerns manufacturing these mechanisms or materials. What one manufacturer does not say another will, and very often a rival firm will reveal the defects of its competitor's products by its advertisements. In fact, if you want to find out what is the "nigger in the wood-pile," read the advertisements of a rival manufacturer. Of course it is not good taste in advertising to knock the other fellow's products, but general statements are made which are enough to enlighten the alert reader as to what should be the good points to look for.

For example, suppose the architect knew little or nothing about what should be the good qualities of a hot-air furnace of the pipeless type, but had before him the advertisements of various makers which we will designate as *A*, *B*, *C*, *D*, and *E*, although the quotations which are given are accurately taken from real advertisements of well-known firms, the identity of which we have purposely concealed under the assumed titles of the letters of the alphabet.

Let us pick up advertisement of (*A*) manufacturer, and select what appears to be the important statements which occur in it. We read: "The grate is slightly cone-shaped, which breaks up all clinkers and makes the fuel roll toward the wall of the fire-pot, where air is mixed with the gas. This generates a much greater degree of heat than it is possible to obtain with the old duplex and flat grates, and clinkers that would form and be wasted in other furnaces are thereby consumed." From this the architect has learned to consider the question of the grate, and certainly he has definitely found out what is the disadvantage of the furnaces which use the old duplex or flat grates. It ought to be his aim to ask the manufacturer of furnaces using these types of grates what they have to say in defense of this indictment.

But let us continue to read: "The ash-pit is large and roomy on the inside, and is provided with a very large door, which makes it convenient for the removal of ashes." It is evident from this that there are furnaces on the market which have this defect of too small an ash-pit and door. The architect can then mentally pigeonhole this as a point to be considered in examining a furnace.

Continuing our reading we come across this statement: "The (*A*) radiator is cast in one piece, with no joints to be cemented or bolted together." This is evidently a reflection upon the weaknesses of other makes which have radiators that are bolted and cemented together, and on investigation we soon learn that furnaces often have leaky radiators which permit the coal-gas to escape into the warm air delivered through the house. Here is a definite defect to be remembered.

Suppose we turn now to advertisement (*B*), and here we read the following: "Insulating air-chamber acts as a positive division between the bodies of warm and return air." This is certainly a hint of a possible defect in a furnace. Perhaps not all of the furnaces are adequately insulated at this division between the bodies of returning cold air and the outgoing warm air, with the resulting loss of efficiency and sluggishness of circulation.

Reading on in the same advertisement we find the fol-

(*Continued on page* 390.)

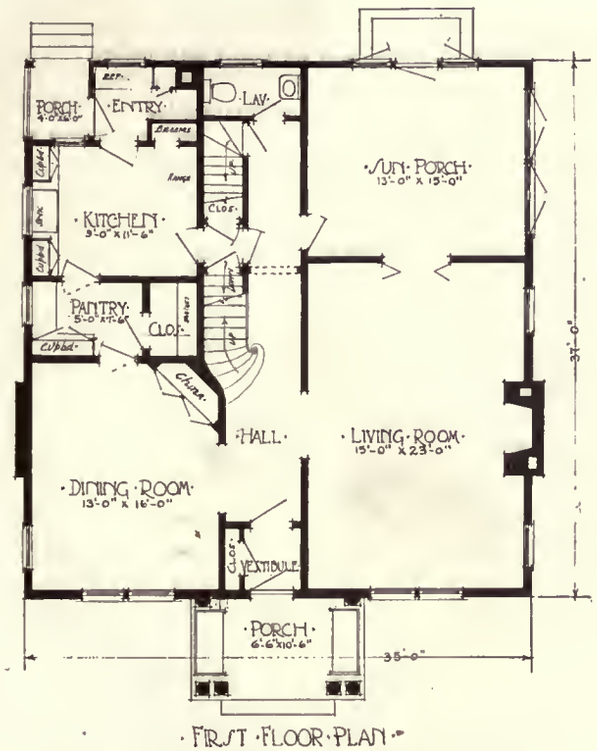
FIRST-FLOOR

SECOND-FLOOR

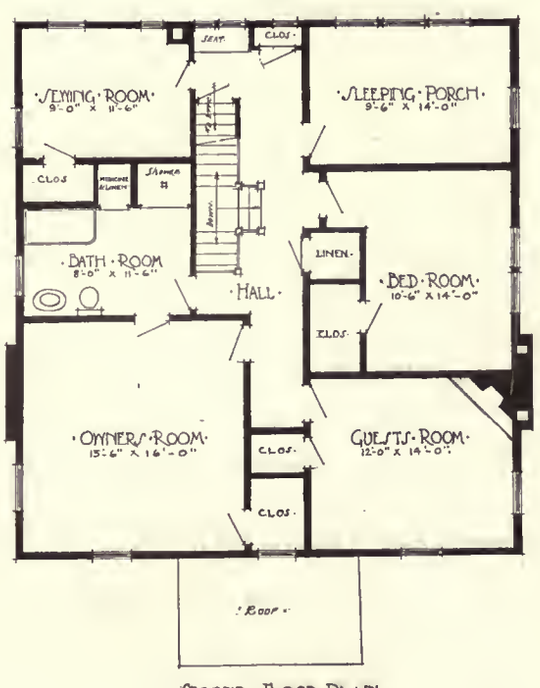
PLANS-OF-HOUSE-AT-ST-ALBANS-PARK-LONG-ISLAND-N.Y.

ADOLPH-WITSCHARD-ARCHITECT

56-WEST-45-STREET-NEW-YORK-CITY.



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE AND PLANS, M. J. STRAUSS, ERIE, PA.

G. Wesley Stickle, Architect.

(*Continued from page* 387.)

lowing: "The (*B*) smoke-plate is an added precaution against the leakage of smoke and gas." Evidently there is some possibility of smoke leaking into the warm air, or else this device would not have been suggested, and probably there are some furnaces where this is a very serious objection.

Turning to the next advertisement, (*C*), we read: "Only the best grade of iron goes into the casting." This is another consideration; for evidently, from the following, certain types of furnaces do not use the best castings, and give trouble. "Break-downs and imperfections are reduced to a minimum. The endless series of treatments and repairs is never required."

A further reading tells us that "the humidifier is ample capacity," which statement suggests the possibility that not all humidifiers are large enough.

But look what advertisement (*D*) informs us: "No heat lost by being radiated through casing into cellar." This is certainly an interesting point to consider. And reading on we learn: "Long fire-travel in radiator insures a cool smoke-pipe and there is no fuel wasted." This is surely a matter of design that ought to be observed in good furnaces.

Still another fact is brought to light by "Fire-pot—one piece, heavy-ribbed for purposes of increasing its radiating surface and to give it greater power of resistance against expansive force of the fire."

But here is something none of the other advertisements have told us: "Steel radiators are preferable for the use of hard coal; cast-iron radiators for soft or hard coal or wood." Also: "Radiators can be turned in either direction, thereby permitting smoke-pipe to be connected with chimney from the most advantageous point."

Finally, when we read in advertisement (*E*) the following, "Grate-bars are quickly removed and replaced. No bolts used," we wonder whether other furnaces use bolts, and whether there is a real objection to them.

Taking the information given in these advertisements, we can now make the following list of points to be considered in selecting any one make:

1. Is the grate so designed that clinkers will not form and not be wasted?
2. Are the grate-bars easily removable?
3. Is the ash-pit large and roomy and is the door amply large?
4. Is the radiator in one piece or so well fastened that it is gas-tight?
5. Is the radiator steel or a high grade of cast iron?
6. Is the inner casing so well insulated that it prevents premature heating of the descending air-currents?
7. What protection is there to prevent the chance passage of smoke into the warm air-chamber?
8. Is the outer casing properly insulated to prevent the waste of heat into the cellar?
9. Is the humidifier of ample capacity?
10. How is the fire-pot designed to increase the efficiency of its radiating surface and how is it strengthened against the expansive force of the fire?
11. Is there a long enough passage for fire-travel, so that no waste of heat is lost up the chimney?
12. Is the radiator flexible enough to permit of the connection of the smoke-pipe from the most advantageous point?

Most certainly this is an array of matters to be considered in the selection of a furnace which no one, except an expert, would think of, but they are all drawn from the advertisements, and this process of study is open to any one who is interested in learning the technical difficulties involved in the selection of this particular mechanical device. Perhaps not all of the knowledge gained is scientific, but at least they are stimulating bits of information that should be investigated.

Let us take one more example of this amusing game of comparing advertisements as applied to roofing materials. Here we will find many conflicting statements, but out of the whole battle of words we can glean some interesting truths.

Turn to advertisement (*A*) and we read the following: "Nearly every objection to wood shingles as a roof-covering is applicable to slates, which have still other adverse features. Slates are not fireproof. Ask the underwriter how the insurance companies regard them, and especially how, in comparison with clay tiles, they are not permanent, though more so than wood shingles. . . . Slates attract lightning, and while the sun warps shingles and the wind rips them off, slates are easily broken, and if there is even a slight settlement or vibration, repairs are necessary. Moisture gets under them, and during the winter months especially causes them to lift up and break off. When the ice thaws, the broken pieces slide out, leaving a defective place in the roof. This will happen every winter with a slate roof, and to keep such a roof in perfect condition it must be gone over each spring and the broken slates replaced with new ones."

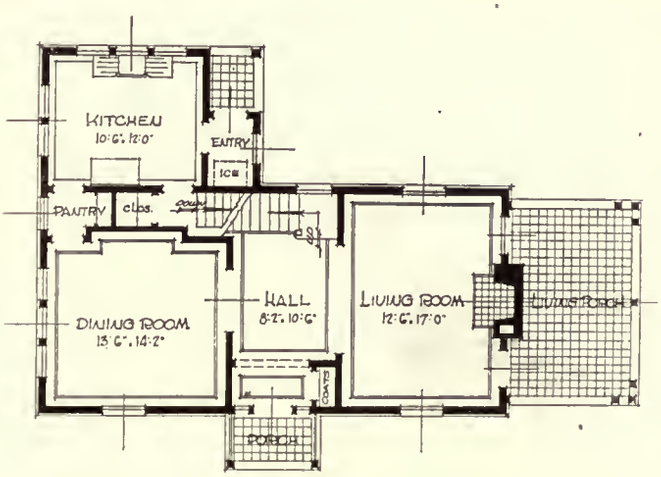
Turning to advertisement (*B*) for asbestos shingles we read a different point of view: "Unfortunately, however, slate, particularly that which is obtainable on the market at present, does not last much longer than *clay tile* or tin shingles."

But reading from advertisement (*C*) we are amused at the following: "Slate being solid rock, they simply cannot wear out. They cannot rust, decay, crack, tear, warp, shrink, disintegrate, melt, burn, or smoulder. They will not contract or expand under the influence of heat or cold. They never need painting. They will not attract lightning—nor will they permit the growth of moss or decaying vegetable matter. . . . One of the most important advantages is from the insurance standpoint. Many roofs (not alone wooden shingles) are highly inflammable; but a slate roof will not ignite from sparks from fire in an adjacent building, from passing locomotives, or from any other cause. This fact is so well recognized that insurance companies allow a very substantial reduction in rates on slate-roofed buildings."

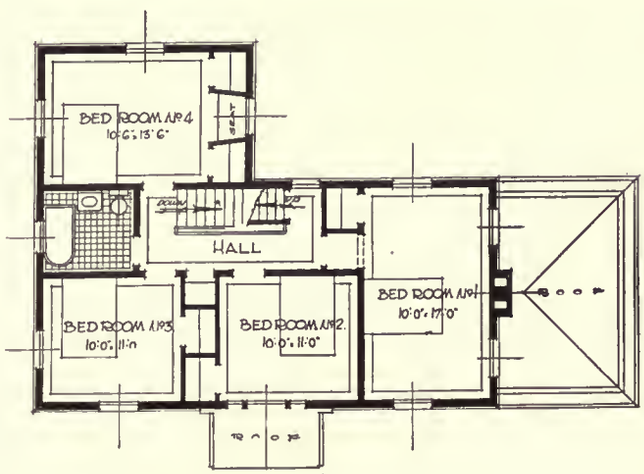
The contradictory statements here are very amusing, but the truth can be seen between the lines, that the makers of clay tile really believe that slate is their real rival, and have searched very hard to pick flaws in it as a material for roofing. And when the advertisement of the asbestos-shingle manufacturer is read, we learn that slate does not last much longer than clay tile. But both are insistent upon the opinion of the fire underwriters, and for this reason we naturally turn to see what they have to say, and we find that both slate and tile are under Class A roofing materials, with little difference made between them. As for the point of attracting lightning, why is slate used for switchboards if it is as good a conductor of electricity as a statement of the above type would imply? It is quite evident that one's opinion of slate after all this controversy will be about on a par with one's opinion of clay tile, and that one will realize that poor grades of either slate or tile, or poor workmanship, are rather more the causes of failure than the material itself.

Many more examples might be given of this interesting method of learning the truth from advertisements, but the principle in all cases remains the same, so that further quotations would only amuse rather than instruct.

GENERAL EXTERIOR.



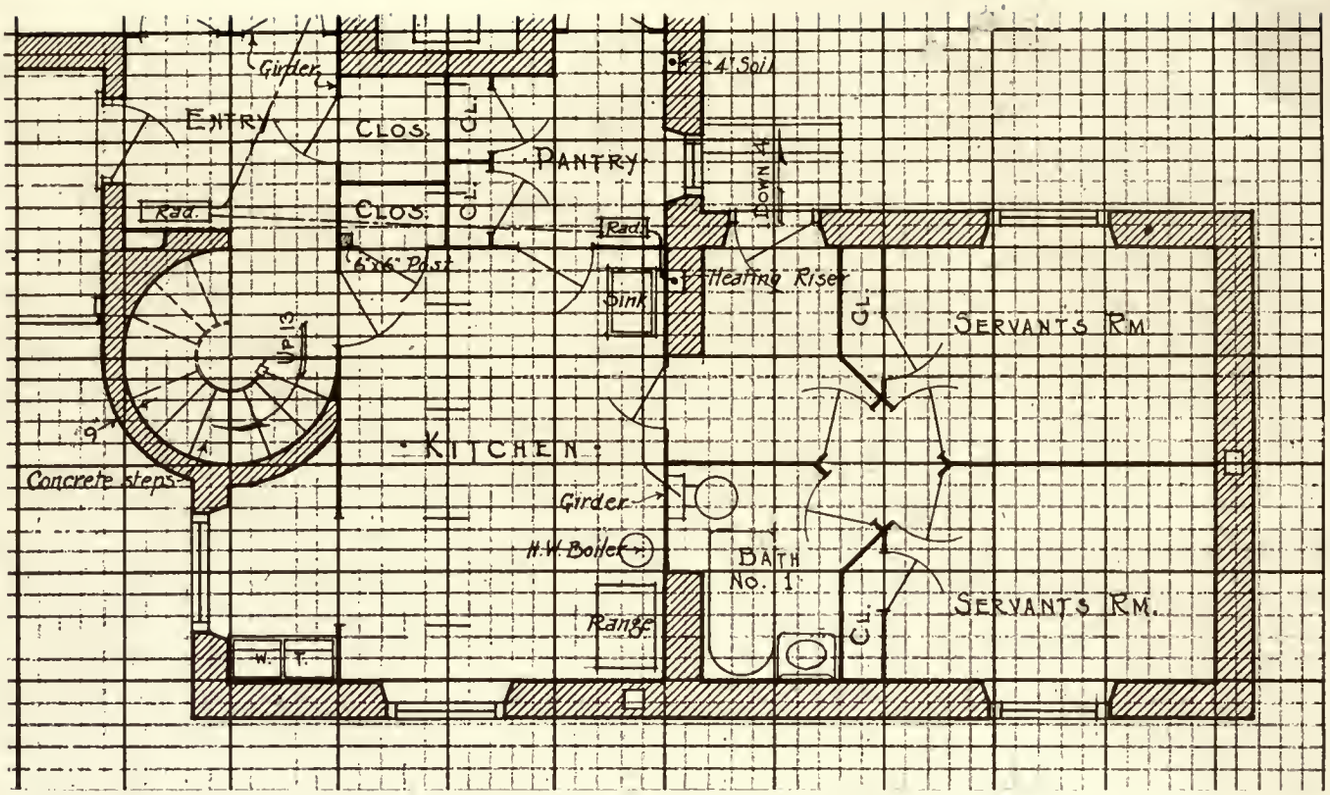
FIRST FLOOR PLAN



SECOND FLOOR PLAN

BED ROOM AND BATH ON THIRD FLOOR

HOUSE AND PLANS. W. LAUD-BROWN, TENAFLY, N. J. R. C. Hunter & Bro., Architects.



Owing to difficulties in the way of reproduction, the working drawings which accompanied Mr. Flagg's article on "Design by the Use of a Module" in our October issue were somewhat confusing, the various lines not having registered properly. In order to explain more clearly what was intended, a section of one of the plans is herewith reproduced in full size.

Interfloor Transportation

THE D'Humy Motoramp System is offered as a solution of the problem of interfloor transportation as possessing marked advantages over the usual type of ramp, and being superior in many ways to elevator installations. It may be used in factory buildings of all sorts, and also in automobile and motor-truck sales and service buildings and garages. It is almost as compact and economical of space as an elevator installation, but affords all the advantages of a ramp construction.

The notable features of the D'Humy System are obtained by the use of a staggered floor building in which the structure is divided into two vertical sections, the floors in one section being placed half-way between the floors in the other section. Because of this modification the ramps rise a half story at a time instead of a full story. This in itself is an important advantage because it reduces the ramp length by one-half, and consequently the location of ramps in any building is a much more simple problem than where full-length ramps are employed. The ordinary ramp is so bulky that it is invariably difficult to place it so that it does not interfere in some way with the best building layout. The short ramps employed by the D'Humy System, however, remove this difficulty. The location of D'Humy ramps offers no more of a problem than the location of a single elevator.

From the Portland Cement Association we have received the folder showing a number of "Concrete Schoolhouses." Fire protection in school-buildings needs no argument, and yet there are thousands of such buildings throughout the country that are a daily menace to the children who attend them.

Announcements

The "Temperature Regulator Chart or Engineering Data Sheet," sent in by The Fulton Company, Knoxville, Tenn., is something that every engineer and architect has wished for at one time or another.

In figuring the proper size tank regulator nearly every one is inclined to figure too high, but if guided in your selection of the Sylphon temperature regulators by this chart, they should give perfect satisfaction.

Too large a regulator not only adds expense but results in merely "cracking" the valve, which produces wire-drawing action with obvious results. Our experience has shown that 90 per cent of all trouble jobs were caused by regulators larger than necessary, or in failing to have the balanced valves ground for the correct pressure. We grind our Sylphon temperature regulator valves for the pressure to be used on each particular installation.

The chart shows a column of *Absolute Pressures*, and also one of *Gauge Pressures*. They call attention to this lest some confusion may arise regarding the two columns.

The company invites, and will much appreciate, comments on the chart. Copies will be sent upon request.

The American Ventilating Co., Pittsburgh, have sent us their valuable catalogue of the American-Carson Suction Ventilators, installed in many important buildings throughout the United States, among them the great Pennsylvania Railroad Station in New York. The many illustrations show the details of construction and the principle of their operation.

We have received the attractive and interesting pamphlets of the Oak Flooring Manufacturers Association, Ashland Block, Chicago.

William H. McKay, 179 West Rock Avenue, New Haven, Conn., announces his removal from New York to the above address. Manufacturers' catalogues and samples are requested.

The Thermal Appliance Company, Inc., of New York, manufacturers of industrial and domestic water-heaters, has just issued a very interesting little booklet entitled "Hot Water Comforts in the Home," showing the many advantages to be found in their domestic "Taco" water-heater.

The booklet will interest all architects and builders. It is attractively printed in two colors, replete with illustrations and diagrams, featuring their domestic water-heater, known as the "Taco."

The offices of Will Levy, architect, are now in the Dolph Building, northeast corner of 7th and Locust Streets, St. Louis, Mo.

We have received a handsomely printed brochure illustrating some of the buildings designed in recent years by T. Beverly Keim, Jr., architect and engineer, of Los Angeles, Cal.

"The Code at a Glance. Alphabetical Tabulation of the Requirements of the National Electrical Code, with a Handy Glossary Defining Words and Terms that Are Often Misinterpreted." By Hulbert S. Wynkoop, M.E. In charge of Electrical Inspection, city of New York. Published by the National Association of Electrical Contractors and Dealers, 15 West 37th Street, New York.

Every architect will be glad to have a copy of the "General Catalogue of Gould Quality Woodwork," with illustrations of their varied products. It includes the universal price list of sash, doors, and blinds, revised official standard moulding list and complete line of woodwork, standardized designs. Gould Manufacturing Company, Oshkosh, Wis.

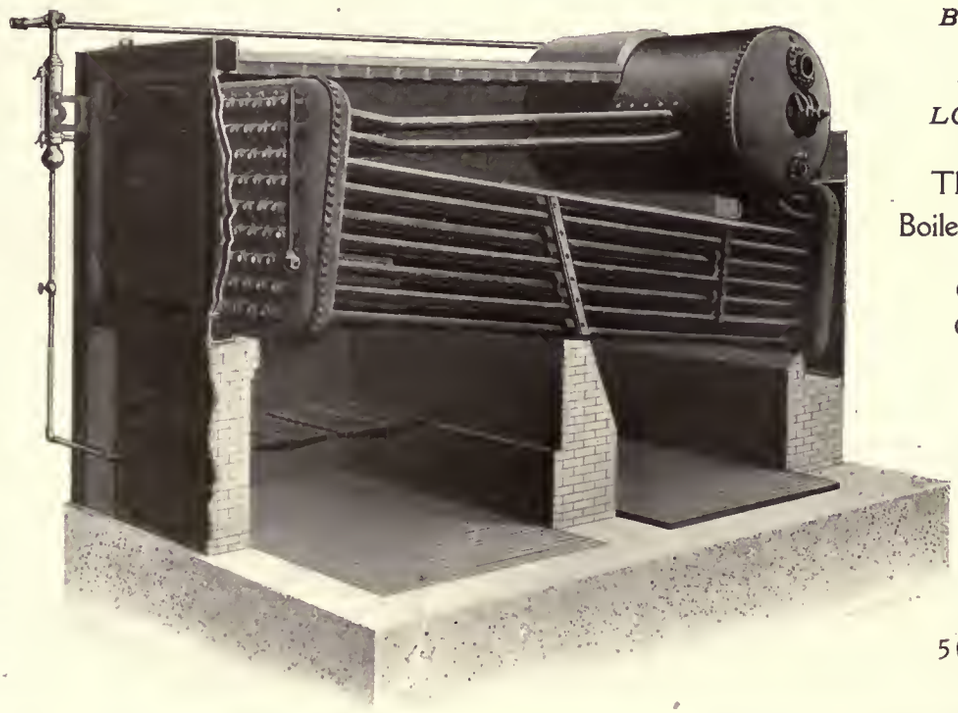
"The Portfolio of Architectural Details in Brickwork," issued by the American Face Brick Association, Chicago, includes many admirable examples by well-known architects. The plates are made from excellent photographs and are handsomely printed.

We have received from The Associated Tile Manufacturers "Documents Relating to Specification for Tile Work, Work Sheets for Specification Writers, and Basic Specification for Tile Work and Related Documents."

The handbook of the Truscon Steel Company, "Truscon Steel Sash," can be had for the asking. Its eighty pages contain standard dimension tables, architectural details, specifications, and more than twenty pages of illustrations. Engineers, architects, and contractors who received advance copies for criticism declare it to be the most practical and handy reference book ever printed on steel windows. It is published by the Truscon Steel Company, Detroit, Mich.

GEARY WATER TUBE BOILER

CROSS DRUM TYPE



BUILT IN ALL SIZES

ALSO MADE WITH LONGITUDINAL DRUM

This is a cross section of the Boilers installed in the

GLOBE INDEMNITY COMPANY BUILDING
AT NEWARK, N. J.

MADE BY THE

OIL CITY BOILER WORKS
OIL CITY, PA.

Eastern District Sales Office:
501 FIFTH AVENUE
NEW YORK CITY
H. O. DILL, Manager

Atlantic Terra Cotta, always desirable for the exterior elevations of a building, is a practical necessity when the design calls for modeled detail in color.

The walls of the building illustrated are Atlantic Terra Cotta, conglomerate in color. The Studebaker trade-marks, and the sign over the right elevation, are white Terra Cotta against black.

Architectural flexibility, expressed in little details of this kind, is characteristic of Atlantic Terra Cotta.

Studebaker Building, Brooklyn, N. Y.
Tooker & Marsh, Architects
Moody Construction Co., Builders

Copyright

Atlantic Terra Cotta Company

350 Madison Avenue, New York

Southern Factory:

Atlanta Terra Cotta Company
Atlanta, Georgia

ARCHITECTURE

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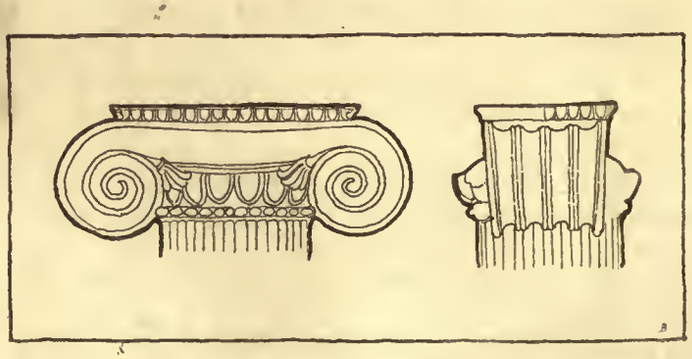

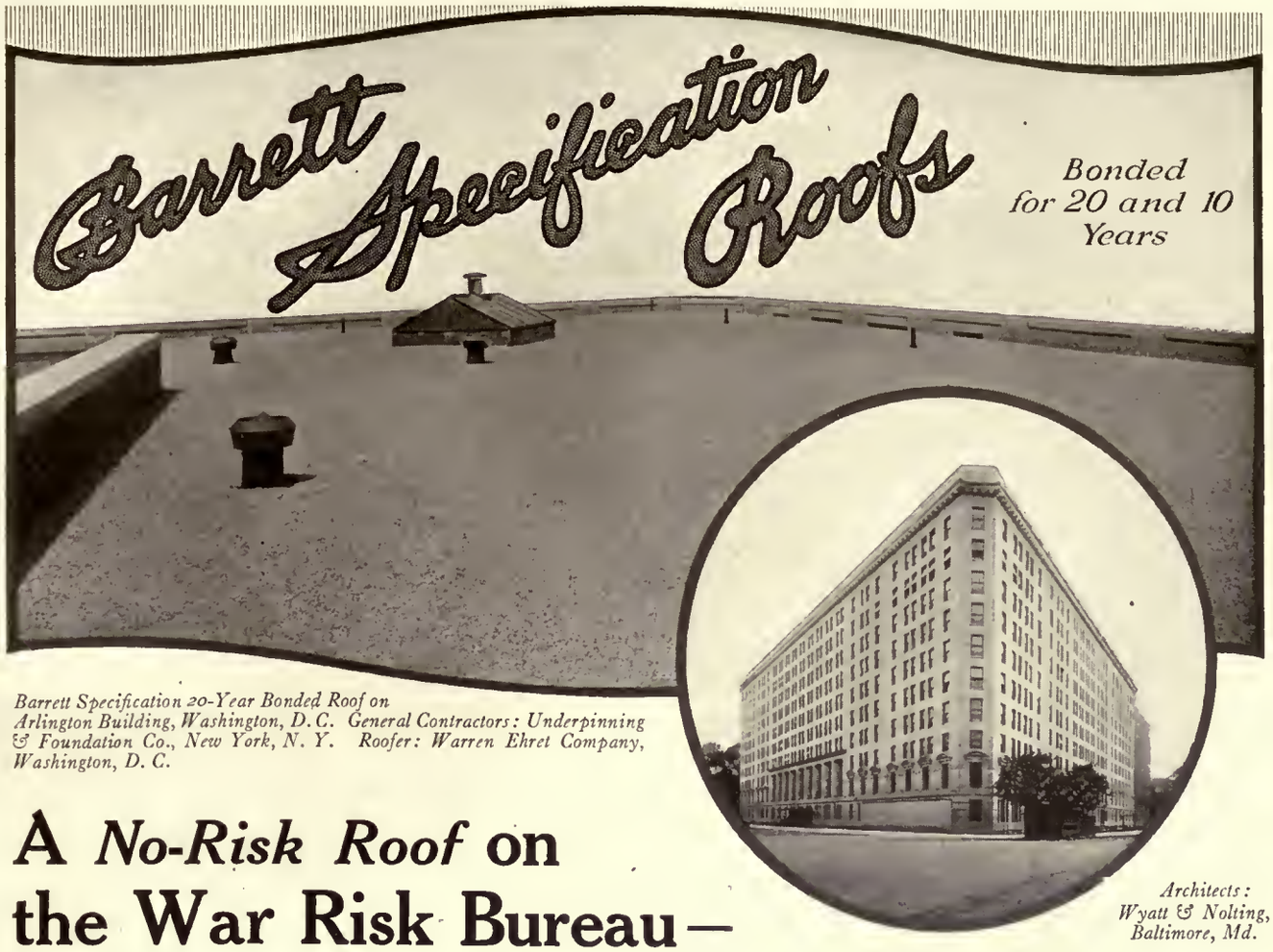

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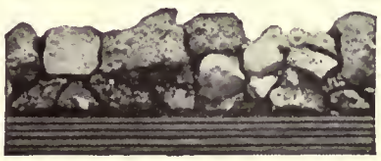

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H. M. Tilford, Esq.	24–26 West 52nd St.	Hiss & Weekes	George Arents, Sr.	820 Fifth Ave.	Lewis Colt Albro
Walter P. Bliss, Esq.	6 East 87th St.	Hiss & Weekes	E. R. Stettinius, Esq.	1021 Park Ave.	Lewis Colt Albro
Hon. Levi P. Morton	Washington, D. C.	John Russell Pope	Alfred DuPont, Esq.	Roslyn, L. I.	Carrere & Hastings
Temple of the Scottish Rite	Washington, D. C.	John Russell Pope	Betram H. Borden, Esq.	48 East 68th St.	Carrere & Hastings
Henry Barton Jacobs, M.D.	Baltimore, Md.	John Russell Pope	William Salomon, Esq.	1020 Fifth Ave.	Soldwedel & Tatton
J. K. Branch, Esq.	Richmond, Va.	John Russell Pope	Cartier	633 Fifth Ave.	Carlhian & Co., Decorators
Stephen C. Clark, Esq.	42–44 East 70th St.	Frederick J. Sterner	Samuel L. Fuller, Esq.	43 Park Ave.	Delano & Aldrich
Lyman B. Kendall, Esq.	Bar Harbor, Me.	Frederick J. Sterner	National City Bank	42nd St. & Madison Ave.	McKim, Mead & White
Edward A. Day, Esq.	Morristown, N. J.	Frederick J. Sterner	Chair for President Harding	White House	Alfred C. Bossom
Charles M. MacNeille	15 East 91st St.	Frederick J. Sterner	Harkness Memorial Library	New Haven	James Gamble Rogers
Mrs. G. Watson Ziegler	2–4–6 East 63rd St.	Sterner & Wolfe	Misses Masters School Library	Dobbs-Ferry	Cram & Ferguson
Geraldyn Redmond, Esq.	69th St. & Park Ave.	McKim, Mead & White	Henry F. Sinclair	79th St. & Fifth Ave.	C. P. H. Gilbert
Calumet Club	12 West 56th St.	McKim, Mead & White	Miss Elizabeth Marbury	13 Sutton Place	Mott B. Schmidt
Pennsylvania Hotel	33rd St. & 7th Ave.	McKim, Mead & White	I. M. Stettenheim Library	910 Fifth Ave.	Necarsulmer & Lehlbach
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Saint Paul Public Library	St. Paul, Minn.	Electus D. Litchfield	Irenee Du Pont	Wilmington, Del.	Albert Spahr
Douglas K. Brown, Esq.	Dobbs-Ferry, N. Y.	Litchfield & Rogers	James McCreery	West 34th St., N. Y.	Arthur C. Holden
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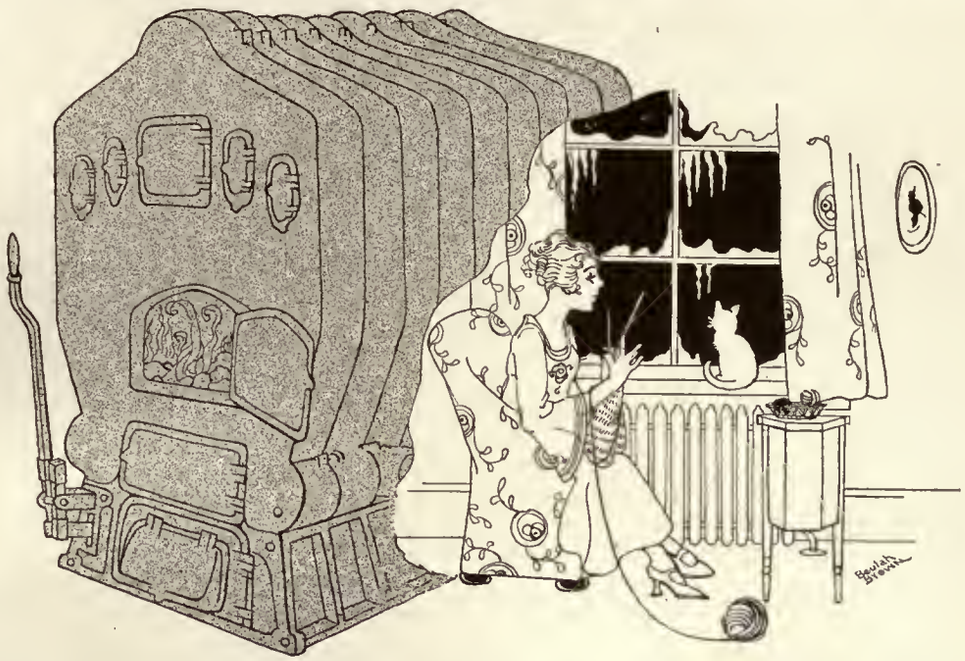

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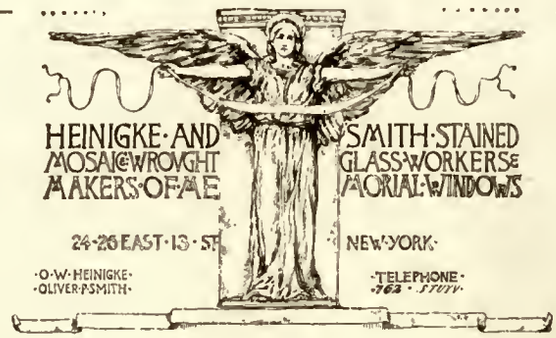

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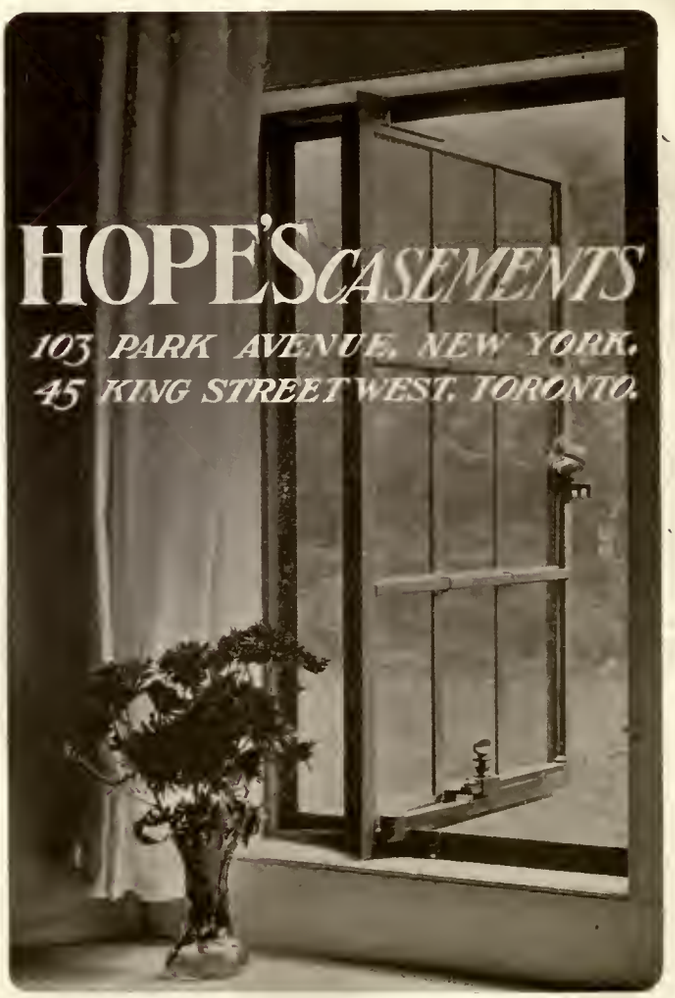

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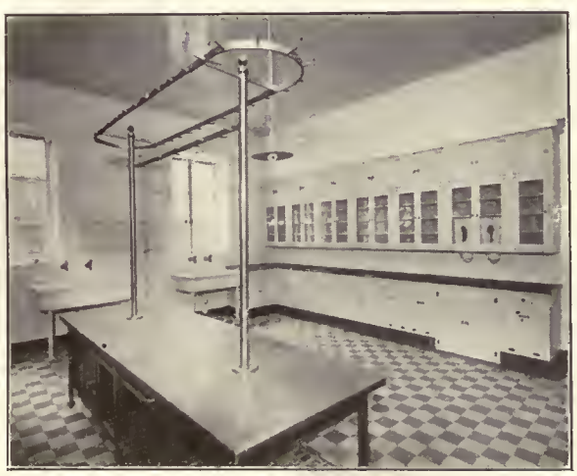

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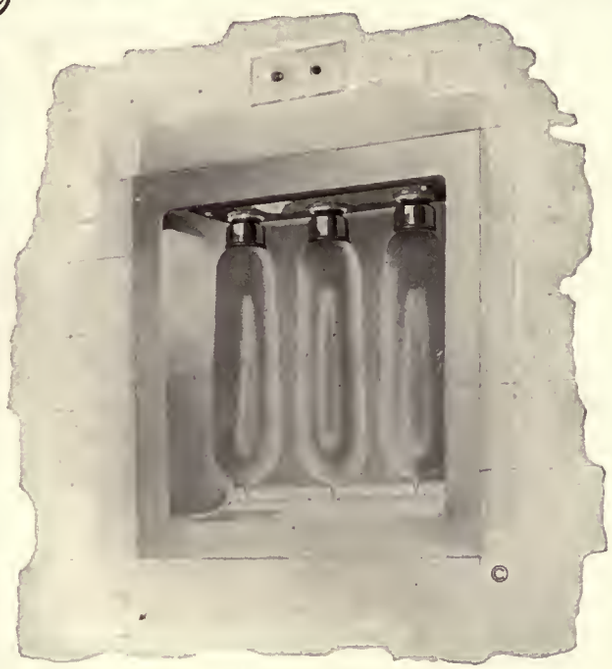

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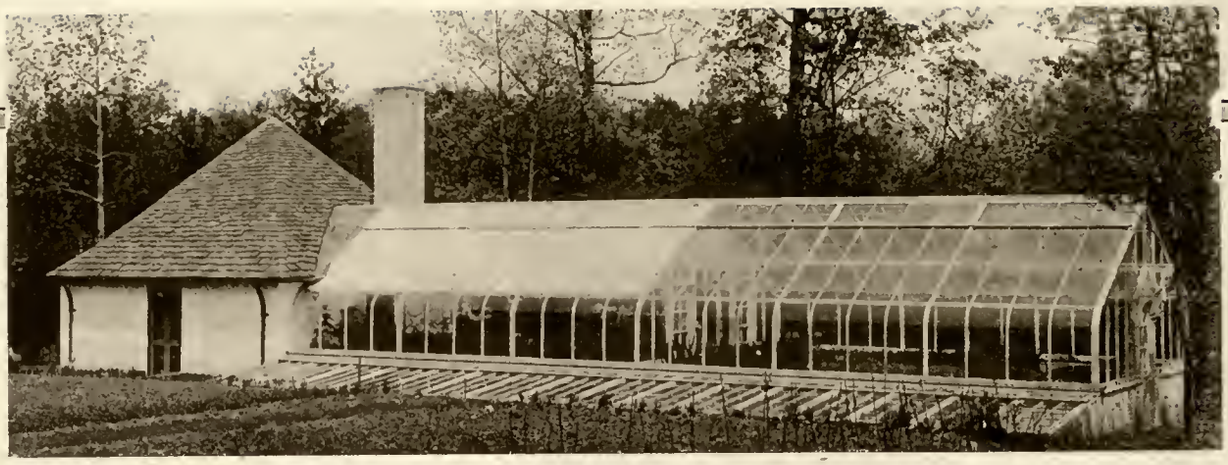

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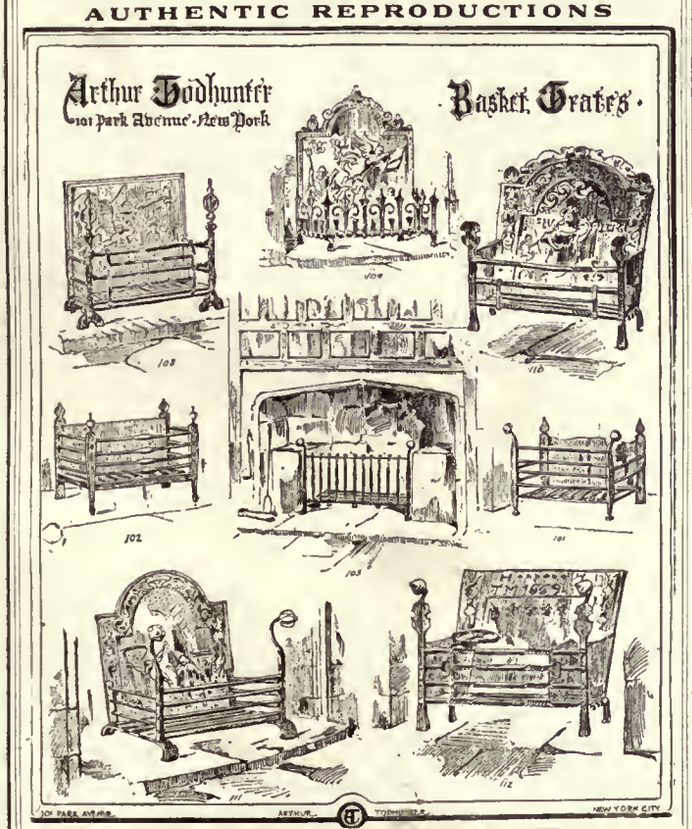

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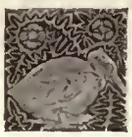
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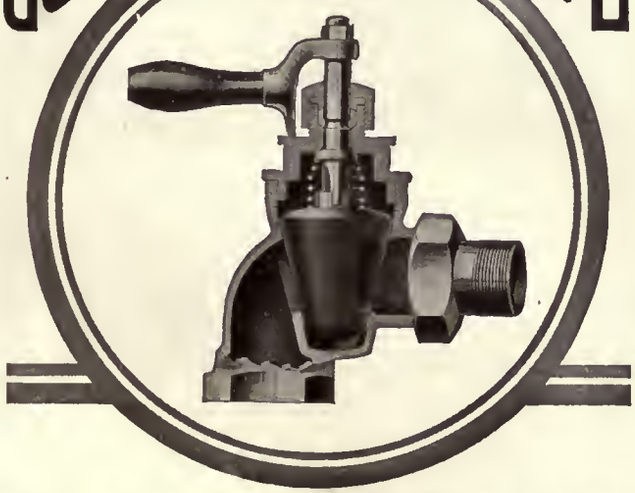

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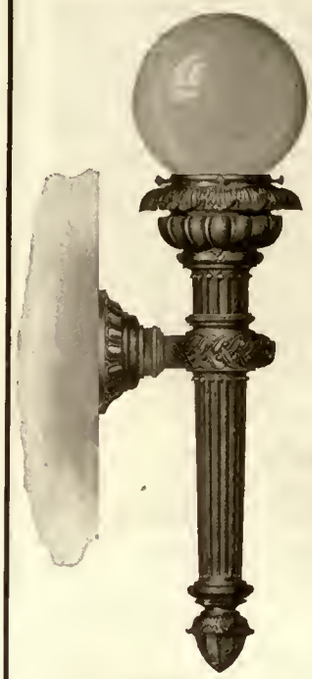

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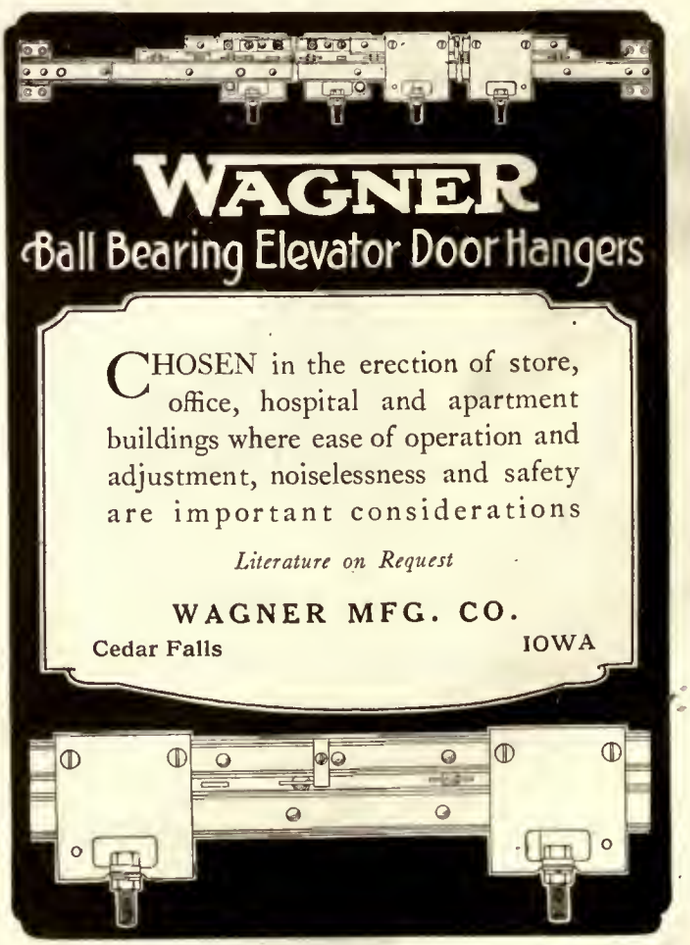

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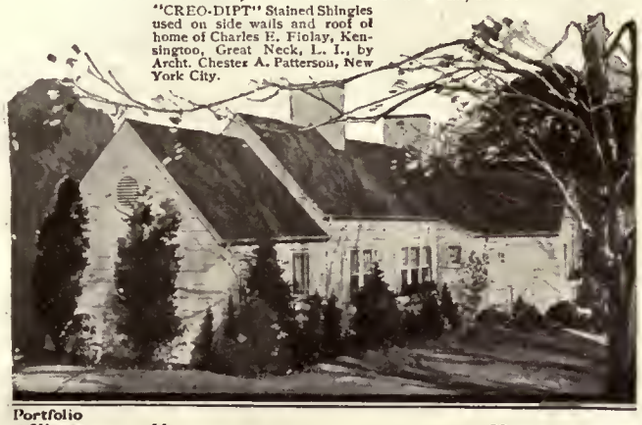

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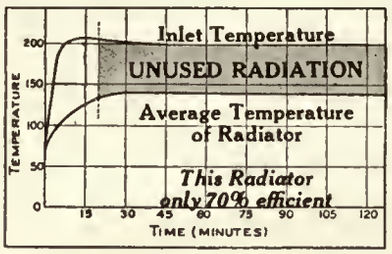

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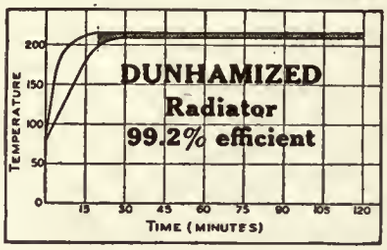

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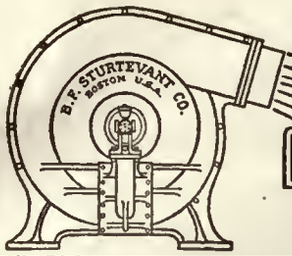

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In the Equitable Building, New York, forty stories with floor area of 2,000,000 square feet, where pressures are high, and where safety of life and property, fuel economy, and power efficiency are dependent upon valves, you will find Jenkins Valves—large extra-heavy iron-body valves standing higher than a man, and hundreds of smaller types.

Jenkins Valves are made in types and sizes to meet all requirements of power-plant, plumbing, heating, industrial, and other service. For over half a century they have been specified without hesitancy by architects, engineers, plumbers, steam-fitters, and others who know valves and valve requirements.

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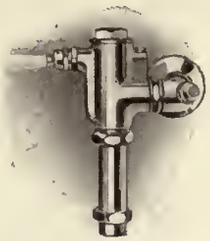

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